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Canada	C$? 50	Kuwait	Fils 500	Spain	Pta 95
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Egypt	E£1.00	Luxembourg	LFr 35	Sweden	SKr 6 50
Finland	Fmk 5.00	Malaysia	Rm 4.25	Switzerland	SwFr 2
France	FFr 5.00	Mexico	Pes. 300	Taiwan	NT 585
Germany	DM 2 00	Morocco	Dh 6 00	Tunisia	Din 0 600
Greece	Dr 60	Netherlands	Fl 2.25	Turkey	L 150
India	Rup. 15	Norway	NKr 8 00	U.A.E.	Dh 5 50
Indonesia	Rp 2500	Philippines	Pes. 20	U.S.A.	$1.50

FINANCIAL TIMES

EUROPE'S BUSINESS NEWSPAPER

No. 29,080 — Monday May 23 1983

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Wall Street's delayed reaction to money supply rise, Page 20

NEWS SUMMARY

GENERAL

Many die in new Lebanon troubles

At least 23 people were feared dead after a wave of abductions by rival Druze and Christian communities in the Shouf Mountains outside the Lebanese capital, Beirut.

More than 100 people from both sects were kidnapped at road-blocks. In Beirut, Lebanese Premier Shafiq al-Wazzan called on Syria to withdraw its troops from the country to test the reliability of Israel's pledge to withdraw. Report; Arafat seeks support, Page 2

In Israel, police held two suspects in connection with the murder three months ago of peace demonstrator Emil Grunzweig.

Doctors on strike

Seven thousand Israeli Government-employed doctors walked out of hospitals and clinics while the Cabinet met to discuss their pay

500 bombs thrown

About 500 petrol bombs were thrown at police in Bogside, Londonderry, early yesterday. It was the worst attack on police in that part of troubled Northern Ireland for several years.

Apartheid blamed

Archbishop Dennis Hurley, chairman of South Africa's Roman Catholic bishops' conference, said the Government's apartheid policies were largely to blame for the Friday bombing in Pretoria in which 17 people were killed. ANC warning, Page 2.

Air show crash

A Canadian Starfighter exploded in the air at a U.S. military air show outside Frankfurt, and wreckage killed three adults and two children in a parked car. The pilot ejected safely.

War deaths charge

Albert Rauca, 74, a Canadian since 1956, was flown from Toronto to West Germany to face charges of ordering the deaths of 11,584 Lithuanian Jews as a Nazi secret police officer in World War II.

Turks' freedom swim

Six Turkish nationals, four of them Kurds, sought political freedom in Greece after swimming across the River Evros in Thrace.

Soviet music ban

Soviet cultural authorities have banned the first performance, in Moscow, of an oratorio, The History of Dr Faust, by leading Soviet modernist composer Alfred Shnitke. It is due to be performed in Vienna next month.

Malawi deaths

Political struggles linked with the succession to President Dr Hastings Banda are believed to lie behind the death of two senior Ministers in Malawi. Page 2

Avalanche kills four

An avalanche hit the Italian town Teglio near the Swiss border, killing four people and injuring 19. Seven people were reported missing.

House to emigrate

Work starts today on dismantling a Southampton, England, house and shipping it to Bundaberg, Queensland, where Australian flying ace Bert Hinckler, who lived in it when working as a test pilot, plans to re-erect it.

Briefly...

Alain Prost (France, Renault) won the Belgian Grand Prix at Francorchamps.

Palermo: Police have arrested 52 Mafia suspects in connection with a nationwide meat racket.

Rome: Former Italian international Giorgio Chinaglia has offered to buy Lazio soccer club for $7m.

BUSINESS

Brazil split over $84bn debts

● BRAZIL'S leading business federations are divided over how best to tackle repayment of its $84bn external debts. Page 2. Leading article, Page 18

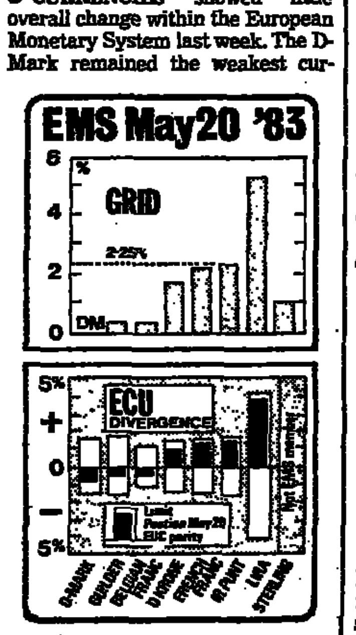
● CIVIL AVIATION: Further efforts will be made at talks opening in London today to improve Anglo-U.S. relations. Price fixing and the Laker Airways' conspiracy case are likely prominent issues. Page 20

● THYSSEN chief executive Dr Dieter Spethmann attacked successive West German governments for failing to protect the country's steel industry against subsidised European competition. Page 20

● CURRENCIES showed little overall change within the European Monetary System last week. The D-Mark remained the weakest currency, although it was comfortably inside its divergence limit. Thursday's meeting of the Bundesbank central council left key interest rates unchanged.

There appeared to be little scope for any downward adjustment, given the current high level of U.S. interest rates. Hopes of an early cut in rates have receded in the face of higher U.S. money supply figures, although there are still hopes that some reduction may take place before the Williamsburg Summit.

On Wednesday, EMS central rates were revalued by just over 1 per cent, although that left currency cross parities unchanged.



The chart shows the two constraints on European Monetary System exchange rates. The upper grid, based on the weakest currency in the system, defines the cross rates from which no currency (except the lira) may move more than 2¼ per cent. The lower chart gives each currency's divergence from its "central rate" against the European Currency Unit (ECU), itself a basket of European currencies.

● CHINESE delegation arrives in London for two weeks of talks with UK Government and company officials, offering incentives for participation in oil projects in the Shenzhen region. Page 3

● WALL STREET analysts are beginning to sound a more cautious note after the slow response in investment attitudes following the renewed rise in M-1 money supply. Page 20

● EUROPEAN truck exports will fall nearly 30 per cent this year, says the London-based DRI Europe group. Page 3

● EMPLOYMENT in the world is the subject of today's special Statistical Analysis feature on Page 5.

● WHEELOCK MARDEN, the Hong Kong shipping, trading, and property group, reported 1982 profits 84 per cent down at HK$192.4m ($27.6m). Page 22

● BRITISH COLUMBIA Forest Products is to reopen two big sawmills in July because of growing U.S. demand and firmer prices.

● NIPPON CHEMIPHAR, the Japanese drug company, lost Y1.8bn ($7.7m) in the year ended March, after a Y1.34bn profit. Page 22

Regan increases speculation over Volcker's future

BY ANATOLE KALETSKY IN WASHINGTON

Mr Donald Regan, the U.S. Treasury Secretary, added fresh fuel yesterday to the speculation that Mr Paul Volcker might not be reappointed as chairman of the Federal Reserve Board when his current term of office expires in August.

Mr Regan said in a television interview that, although President Ronald Reagan had not yet addressed the issue, his decision would be based on three aspects of Mr Volcker's record as Fed Chairman. None of these three aspects appears to stand in Mr Volcker's favour, although Mr Regan did not say that.

The first consideration would be the Fed's general performance under Mr Volcker. This had not accorded with the President's desires until about nine months ago, Mr Regan conceded.

A second main factor would be the President's personal feeling of "ease in his relationship with Paul Volcker."

According to most White House and Fed sources, Mr Volcker has never had a particularly satisfactory personal relationship with President Reagan. In fact, they have only met face to face on a handful of occasions in the past two years.

The third factor in Mr Reagan's decision would be "whether there is someone else who could do the job as well or better," the Treasury Secretary said.

Mr Regan refused to speculate on alternative candidates, but Mr Alan Greenspan, the well known economic consultant and a former chairman of the Council of Economic Advisers, would be the most likely, on the basis of his past experience, to qualify on the last score.

Asked about current monetary policy, Mr Regan also said he was "not alarmed" by the recent upsurge in U.S. monetary growth, although he was "concerned" about the Fed's inability to keep money supply on a steadier course. Nevertheless, interest rates "could easily come down a point or two" further this year with the appropriate monetary policy and with action from Congress in budget deficits, he claimed.

The Administration will try to emphasise the budget deficits from 1985 onwards, Mr Regan and other senior officials made clear over the weekend. This followed last week's vote by the Senate in favour of a budget which was unacceptable to the President because of its tax increases, military spending cuts and high rate of non-defence spending.

The confrontation with Congress will make it all the more important for President Reagan to persuade the nation that he is just as determined as the legislators to reduce budget deficits – but in his own way, according to White House strategists.

In order to prevent Congress, and particularly the Democrats, from seizing the deficits as "their issue," the President will remind the nation that he proposed large tax increases from 1985 onwards in his original budget, presented to Congress in February.

The crucial differences between the President and Congress, Mr Regan noted yesterday, were that the President would not allow tax increases this year to stifle an economic recovery and that he would not raise taxes simply to finance higher government spending.

Mitterrand to consult Giscard before summit

BY PAUL BETTS IN PARIS

M VALERY Giscard d'Estaing will make a brief appearance at the Elysée Palace this week after a two-year absence from his old presidential home. His return appears designed to give greater weight to France's controversial proposal for a new Bretton Woods conference to lay the basis for a more stable international monetary system.

The former French president has accepted an invitation from President François Mitterrand, his old Socialist foe to whom he lost the election in May 1981.

M Mitterrand will consult M Giscard d'Estaing on Thursday before flying to the U.S. to attend the summit of industrial world leaders at Williamsburg next weekend.

Until now M Giscard d'Estaing has flatly refused to return to his old presidential quarters. He has turned down three invitations, claiming he was not prepared to attend social or worldly gatherings at the Elysée. But the former president indicated he would be prepared to return to the palace if it were important for the French national interest.

At the same time, however, while it is traditional for a French president to consult with political leaders before attending a world summit, M Mitterrand did not feel any need to consult with M Giscard d'Estaing before the last unhappy summit at Versailles.

The meeting this week in no way suggests a sudden thawing of relations between the two men, but it seems to be more than a simple coincidence that a week after M Mitterrand launched his controversial call for a new world monetary conference M Giscard d'Estaing has proposed a similar conference to establish a so-called World Monetary System.

M Giscard d'Estaing's proposals for a return to a system of fixed parities were published last week in several European countries including Le Monde in France and The Economist in the UK.

M Mitterrand is clearly hoping that the backing of his old foe will add weight to his argument at Williamsburg to hold a new Bretton Woods conference.

But beyond the international manouevring before the Williamsburg summit, M Giscard d'Estaing's first visit to the Elysée since his humiliating electoral defeat two years ago has significant domestic political implications.

M Giscard d'Estaing's position as a leader of the opposition in France has been waning. Indeed, of the three main opposition leaders, the former president lags behind M Raymond Barre, his former prime minister, and M Jacques Chirac, who is leader of the RPR, France's largest opposition party, and the powerful mayor of Paris.

The meeting at the Elysée and the consultations on a subject as lofty as a new world monetary system could clearly help enhance the national stature of the former president.

As for M Mitterrand, he appears to have everything to gain from flattering his old enemy. By helping to strengthen M Giscard d'Estaing's position within the right-wing opposition when his influence has been on the decline, the President also seems to be attempting to maintain splits in the opposition.

The last thing the Socialists in France want is an opposition united behind one leader, whether it be M Chirac – the strongest candidate at the moment – M Barre or former president Giscard d'Estaing.

Thatcher maintains poll lead

BY PETER RIDDELL, POLITICAL EDITOR, IN LONDON

BRITAIN'S ruling Conservative Party is maintaining its large lead in the opinion polls with no evidence of any substantial advance by either Labour or the Social Democrat-Liberal Alliance as the general election campaign enters its second full week.

Leaders of all parties were yesterday reviewing their strategies ahead of the June 9 poll. But there is no sign of any change either in Labour's approach of concentrating its fire on the Government's policies on unemployment and the welfare state, or in the Conservative emphasis on branding Labour as extreme and irresponsible.

The Alliance campaign committee met in London last night but its strategists do not believe a shift in their approach is needed, despite their poll rating. They argue that the Alliance should benefit from the bitter exchanges between the other two parties.

Mr David Steel, the Liberal leader, said in a radio interview that there was still everything to go for. He pointed out that during the February 1974 campaign, the Liberals' ratings did not start to increase until the middle of the election. He expected an improvement in the Alliance's share to be shown towards the end of this week.

There is no evidence yet of an Alliance pick-up, but canvassers from all parties report a large number of "don't knows." In addition, there appears to be a clear regional pattern with Labour receiving a more favourable response in the North and the Midlands than in London and the South-East, where dissatisfied references to the far left are more frequent.

The latest batch of opinion polls confirms that the Conservative share of the vote is being maintained in the 45 to 47 per cent range, fractionally less on average than 10 days ago. The Labour share is still in the early to mid-30s in percentage terms, while the Alliance is generally in the 17 to 20 per cent range in both cases hardly changed over the last fortnight.

About the only comfort for Labour is that the three most recent polls point to a slight improvement in the Labour share to around 35 per cent.

A Harris Research Centre poll of 44 marginal seats for a television programme gives a Tory lead of 2 percentage points over Labour, compared with 6 points last week and 0.1 per cent in the 1979 election. This is still consistent with a 9 percentage point lead for the Tories nationally

A feature of all the polls is the continuing large number of don't knows. A Harris Research survey in the Observer newspaper yesterday showed 14 per cent who were undecided, would not say or refused to vote, while a Marplan poll for the Sunday Mirror indicated 16 per cent don't knows and a further 4 per cent not voting.

Continued on Page 20

U.S. in talks on Polish sanctions

By Our Washington Staff

THE REAGAN Administration has been holding exploratory discussions with its European allies on the possibility of easing economic sanctions against Poland. Some Administration officials say further relaxations could follow President Ronald Reagan's decision last week to resume talks with the Soviet Union on a long-term grain sales agreement.

In recent discussions with European officials, Mr Richard Burt, the U.S. Assistant Secretary of State for European Affairs, is said to have revived the idea that sanctions could be dismantled on a step-by-step basis in response to any signs that the Polish regime is moving towards less repressive domestic policies.

The European allies have argued from the beginning of the Polish crisis in 1980 that the West's response should be based on a "carrot and stick" approach, using positive incentives, as well as punitive measures, to put pressure on the Polish and Soviet Governments.

President Reagan has been adamant in his public pronouncements since the lifting of martial law in Poland last December that this did not constitute a substantive improvement in the Polish situation.

Officially, removal of economic sanctions against Poland still depends on three conditions: Lifting of martial law; release of political prisoners; and a "dialogue" between the Government, the Solidarity trade union and the Church. But some senior officials have claimed to detect a slight easing in the President's approach, and have argued in the past few days that the resumption of grain talks with the Soviet Union is a symptom of this.

"I think it is clear to everyone now that Poland is better off now it was two years ago or even a year ago," Mr Howard Baker, the Senate majority leader said after a briefing on Soviet trade held at the White House last week.

Other informed sources, however, argue that the President's stance to Poland is still as unyielding as ever, and point out that the National Security Council and the Defence Department may have a very different view of the matter from the "eyes" in the State Department. All agree that the Pope's forthcoming visit to Poland may be crucial in determining the future approach of the U.S.

Nigeria nears accord on trade arrears

BY WILLIAM HALL IN NEW YORK

NIGERIA has made substantial progress towards converting up to $2bn of arrears on letters of credit which the country owes international banks into a three-year loan. This will be a key element in a comprehensive refinancing package aimed at easing the huge backlog of arrears on the country's trade payments which are estimated at up to $5bn.

Details of the package were worked out at a meeting in New York on Friday between Nigerian officials, U.S. banks and representatives of European banks involved in lending to Nigeria.

The main elements of the proposed package are:

● Existing arrears on letters of credit will be rolled into a three-year medium-term loan to the Nigerian Central Bank. The extent of the arrears on letters of credit is uncertain, but they are believed to total about $2bn, less than half Nigeria's total trade arrears, and are owed to about 20 banks;

● It has been made a condition of the package that all the banks involved must disclose their exposure to Nigeria;

● Banks' lines of credit to Nigeria will be maintained at previously agreed levels as the medium-term loan is repaid;

● A bank co-ordinating committee will be established to consult the Nigerians, the International Monetary Fund and the World Bank to determine how much in new loans if any is needed by Nigeria; and

● The proposed three-year loan to cover arrears on letters of credit will be excluded from any future debt rescheduling.

Details of the proposed package will be sent to all the country's European banks this week. Provided all agree, U.S. bankers are confident that a formal offer to the Nigerians on the basis of the package can be made within about three weeks.

The majority of U.S. banks, which are owed close to half of Nigerian arrears on letters of credit, had previously refused to support a European proposal which would simply have combined these arrears into a loan, with no conditions attached.

The U.S. banks had argued that Nigeria's economic problems were

Continued on Page 20

Pinochet faces new pressure from unions

BY MARY HELEN SPOONER IN SANTIAGO

CHILEAN union leaders have formed a national command to pursue a return to democracy after the refusal of General Augusto Pinochet, leader of the country's right-wing military regime, to respond to pressure for change.

His speech at the weekend, which followed a nationwide protest on May 11 in which two died and hundreds were detained, accused the Soviet Union of provoking the unrest. "This is not a fascist government, but a government trying to protect the country from totalitarianism," he said.

The union leaders' move was spearheaded by the copper mineworkers, 10 of whose organisers have been charged with violating the country's state-security law after the May protest. Four other dissident labour groups have joined the command, and if others decide to take part, it could pose a powerful challenge to the Pinochet regime.

Gen Pinochet, who ousted the socialist regime of the late President Salvador Allende in a coup in 1973, is thought to enjoy the support of much of Chile's military high command. Some officers are reported, however, to be deeply concerned about the country's economic crisis.

According to a plan approved by a controversial plebiscite in 1980, Gen Pinochet is to remain in office until 1989.

Ruling out any modification of the plan in his speech, Gen Pinochet criticised his supporters for failing to make their backing plain. Those Chileans participating in the May protest were a "vociferous minority," he said.

Last week, Sr Frederico Mujica, leader of the private employees' confederation and a supporter of the Pinochet regime when it took power, was summoned, with two other moderate union leaders, to separate meetings in the Interior Ministry.

Future of Chilean airline in doubt, Page 4

CONTENTS

Spanish minister under fire

MADRID – A speech in Brazil by King Juan Carlos of Spain has prompted a call for the resignation of Sr Fernando Moran, the Spanish Foreign Minister.

The speech, made by the king in Brasilia last week during his tour of Latin America, repeated part of an article by Sr Felipe Gonzalez, the Prime Minister, which appeared in the French publication Le Monde Diplomatique.

Two Spanish newspapers, El Pais and Diario 16, yesterday devoted editorials to the address, the latter calling on Sr Moran to resign.

The Foreign Ministery plays a key role in the writing of the king's speeches on official trips, Diario 16 said.

"How can people who listen to the speeches of King Juan Carlos believe in their sincerity if they then discover the words were expressed earlier by someone else with a clearly defined ideology?" the newspaper asked.

"It is a serious business which should lead to the resignation of the man responsible, who is none other than the ill-fated Foreign Affairs Minister."

In the repeated paragraphs, King Juan Carlos heralded the start of a new era of relations between Spain and South America and said the task of maintaining and developing existing links would be one of the cornerstones of Spanish foreign policy.

"The Latin American dimension is one of the fundamental objectives of the foreign policy of my country," he said.

No explanation of the repetition of Sr Gonzalez's comment was available from the Foreign Ministry. Reuter

Crackdown feared in Argentina

BY JIMMY BURNS IN BUENOS AIRES

LEADING Argentine politicians at the weekend publicly aired fears of a military crackdown amid a growing controversy over human rights in the country.

The military junta on Friday night issued a lengthy document alleging that members of the leading opposition party, the Peronists, along with human rights activists were organising a fresh outbreak of terrorist violence.

Warning that "May is an important month for the terrorists' plans," the junta also said it had uncovered plans to assassinate several trade union leaders and Sr Angel Robledo, a leader of the moderate faction of the Peronist Party.

The document was a major departure from the cautious public profile favoured by President Reynaldo Bignone, and was reminiscent of the language used to justify the repression of political activity following the military takeover in 1976.

It drew a sceptical response from several political leaders. Sr Antonio Cafiero, a former Peronist economy minister, claimed that sectors of the armed forces were looking for an excuse to provoke a coup.

The junta's warning was issued against a background of the country's biggest ever human rights demonstration to protest at last month's official document on the "disappeared." Led by Sr Adolfo Perez Esquivel, a Nobel Peace prize winner, and leaders of the country's eight human rights organisations, some 50,000 people marched through central Buenos Aires before staging a mass rally outside the building of the Congress. Argentina has been without its parliament since a state of siege was imposed before the 1976 coup.

Sr Esquivel, who was publicly supported by all the major political groupings, drew loud applause in a speech demanding justice for those guilty of human rights violations.

In what was officially described as the last word on the issue of the "disappeared," the junta last month said that thousands of Argentines who had gone missing following the 1976 coup were now dead.

The military's tough stance drew renewed international protest at the weekend. Speaking in Genoa, President Sandro Pertini of Italy accused Argentina's generals of having committed "barbarous crimes" in their fight against terrorism. Sig Pertini said Italy had been plagued by left and right-wing terrorism for the last decade but had not resorted to breaking the law.

Relations between Argentina and Italy have been further strained following the alleged murder by security forces of Sr Osvaldo Cambiaso, a joint Argentine-Italian national.

Brazil's business groups in dispute over debt

BY ANDREW WHITLEY IN RIO DE JANEIRO

BRAZIL'S LEADING business federations are locked in a growing dispute over the need for a moratorium on payments or a further renegotiation of the country's $84bn (£55bn) external debt.

Over the weekend, Sr Ruy Barreto, president of the Confederation of Commercial Associations of Brazil, came out in favour of a temporary suspension of debt payments to allow the Government to put its cash flow back into equilibrium.

Sr Barreto was supporting a similar call made at the end of last week by the National Confederation of Industry.

Powerful opposition to this view has come from the Sao Paulo State Federation of Industries, FIESP, whose president said a moratorium was out of the question.

The immediate consequences, he warned, would be the suspension of oil supplies from abroad and the total collapse of the domestic economy.

In New York last Friday, Sr Ernane Galveas, the Brazilian Finance Minister, said reports circulating among Western bankers that Brazil would be forced soon to declare a full scale moratorium were "baseless." He also described suggestions of a new maxi-devaluation of the cruzeiro as an "unmentionable idiocy."

In a fresh effort to demonstrate to its foreign creditors that it is keeping its house in order, Brazil is expected this week to announce further cuts in state company budgets and sharp increases in domestic

Electronic cash link for seven Nordic banks

BY ALAN CANE IN LONDON

THE NORDIC banks, involving seven major banking institutions across three continents, are co-operating to provide electronic corporate cash mangement services for their customers.

It is thought to be the first time so many big banks have linked to provide an electronic banking service involving the transmission of information about their customers' accounts.

A corporate customer in New York will be able to use a television-like screen in his office to examine the state of his accounts in one or all of the banks in the Nordic group.

They include Copenhagen Handelsbank, the Nordic American Banking Corporation of New York and the Nordfinanz-Bank of Zurich.

The "NordiCash" system has been installed by the UK arm of National Data Corporation (NDC), the U.S. computer services company, which has already installed corporate cash management systems for the National Westminster Bank in London and Dresdner Bank in West Germany.

In the U.S., NDC has installed corporate cash management systems for Manufacturers Hanover and Bank of America among others.

Companies using NordiCash will be able to monitor their currency positions not only for domestic accounts but for accounts abroad. In the future the system will allow payments from accounts abroad through the same terminals.

Mystery of Malawi deaths

By Our Johannesburg Correspondent

POLITICAL STRUGGLES over Malawi's Presidential succession are believed to lie behind the mysterious deaths of two of the country's most powerful ministers, reported in circumstances suggesting domestic confusion.

Mr Dick Matenje, secretary-general to the ruling Congress Party and Minister without Portfolio, and Mr Aaron Gadama, Minister for the Central Region, are said to have been found dead, supposedly in a car accident on the Malawi-Mozambique border, after Malawi radio had broadcast a reward for their discovery.

Reports reaching Johannesburg add that two or three other ministers may have either disappeared or been kidnapped.

There has been speculation about a failed coup, though Blantyre and the capital Lilongwe are reported to be outwardly calm.

Parliament was adjourned last week after the Life President, Dr Hastings Kamuzu Banda, announced that elections would be held next month; the date was later adjusted to June 29.

Dr Banda is in his 80s and the succession, although a taboo subject, inevitably looms large.

Mozambique reshuffle

President Samora Machel of Mozambique has announced a reshuffle of several key ministers involved in security, and the beginning of a Government overhaul to decentralise the bureaucracy, and give a higher priority to agriculture, writes Quentin Peel, Africa Editor.

Upper Volta arrests

Two Upper Volta ministers and a trade union leader have been arrested and accused of fomenting anti-government demonstrations, the ruling People's Salvation Council (CSP) said yesterday, Reuter reports from Quagadougou.

Italian poll pledge

Guido Carli, governor of the Bank of Italy for 15 years and one of Italy's most respected financial figures, said yesterday he would stand for parliament in next month's general election as a Christian Democrat, Reuter reports from Rome.

Sudan accuses Libya

A senior Sudanese official says Libya is helping mercenaries under its command to occupy a Chadian town with the aim of overthrowing the government of Hissene Habre, according to the Sudan News Agency, Reuter reports from Khartoum.

Cyprus anger

The Cyprus Government yesterday accused Mr Rauf Denktash, the Turkish Cypriot leader, of trying to torpedo efforts to reach a solution to the island's dispute, Reuter reports from Nicosia.

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Pretoria bomb is just the beginning, ANC leader warns

BY MICHAEL HOLMAN IN NAIROBI AND J. D. F. JONES IN JOHANNESBURG

MR OLIVER TAMBO, leader of the African National Congress (ANC), warned over the weekend that South Africa should expect repetitions of the Pretoria bombing as part of the intensification of his organisation's campaign against white minority rule.

Mr Tambo said he could not claim responsibility for the attack, in which 17 people died and 217 were injured, until he received reports from within South Africa.

"As soon as we are absolutely sure we will make a statement to that effect," he said on Saturday.

In South Africa, whites are in a trauma of shock and rage as they absorb the implications of the country's worst terrorist assault.

It is now realised that the toll might have been much higher as hundreds of military personnel would normally gather in the street to await transport only minutes after the bomb exploded. The assumption is that the bomb had been prepared for them and might have gone off prematurely, with the result that most of the casualties were civilians.

Mr Tambo declared: "The policy of the ANC (which is banned in South Africa) is to intensify the struggle, attack the enemy, avoiding civilians where possible."

In the past, he said, the ANC had concentrated on sabotage of installations such as railways and buildings. "But intensification involves not just sabotage, but attacking the enemy forces."

South African military raids on ANC offices near Maputo, Mozambique, in 1981, and in Maseru, Lesotho, last December, in which civilians died, had prompted this change of strategy.

When asked whether the Pretoria bombing was an example of what might be expected, he replied: "Absolutely."

Mr Tambo was also asked if Western investment would be excluded from attack. He replied: "No. Foreign firms have become militarised. Foreign capital is now part of South Africa's military might."

The first ANC reaction to Friday's blast came earlier on Saturday in a statement issued from its office in Lusaka, Zambia, which spoke of "an escalating armed struggle." The attack had been directed at a military installation, and casualties were mainly air force and military intelligence personnel, it said. But the statement did not specifically claim responsibility.

The ANC may be reluctant to make such a claim from anywhere in Africa which might be within reach of South African retaliation.

Few people in South Africa doubt that the defence and security authorities will be determined to strike back at the ANC in as dramatic and forceful a manner as possible.

Arafat seeks support against Fatah rebels

BEIRUT—Mr Yassir Arafat, head of the Palestine Liberation Organisation, yesterday continued his efforts to contain a dissident movement among guerrilla officers by visiting Palestinian fighters in two refugee camps on the ouskirts of Tripoli in Lebanon.

Mr Arafat has made almost daily trips to PLO positions in Lebanon's eastern Bekaa valley over the last week to drum up support against a peaceful rebellion by dissident officers in his Fatah guerrilla group there.

Fatah moved to contain the rebellion on Saturday by ordering five leading dissidents to be put under Mr Arafat's direct command and banning other PLO fighters from contacting them. A statement from the group's central committee also pledged to prepare for a Fatah congress—an apparent concession to the dissidents who demanded such a meeting to air their complaints about Mr Arafat's leadership.

Mr Chafiq al-Wazzan, Lebanon's Prime Minister, meanwhile called on Syria yesterday to withdraw from Lebanon and test the reliability of Israel's pledge to pull out its own troops.

"If for whatever reason there is no Israeli withdrawal, the effect on the general conditions in Lebanon and the region as a whole will be of the utmost gravity," he told a Lebanese magazine, Monday Morning.

Mr Philip Habib, President Ronald Reagan's special envoy, yesterday flew to Beirut after meeting Mr Yitzhak Shamir, the Israeli Foreign Minister, in Jerusalem. Accordingto Israeli Radio, he said he remained optimistic that Syria would agree to a withdrawal of foreign forces from Lebanon.

Egypt has turned down a U.S. offer to pay for development of the Ras Banas military base on the Red Sea coast, and is to pay for the work itself. The decision overcomes the problem of control of the base, which had raised the issue of sovereignty, writes Charles Richards in Cairo.

The late President Anwar Sadat originally offered the facilities to the U.S., but refused to allow a permanent base there.

Failure to resolve legal and procedural difficulties has now led the Egyptians to assume the task of doing the work themselves, even though this might take longer because of cash problems.

WORLD TRADE NEWS

European truck exports 'to fall 30%'

By Kenneth Gooding, Motor Industry Correspondent

TRUCK exports from Europe will fall nearly 30 per cent this year, dragging down production by 10 per cent, according to the latest forecast from the London-based DRI Europe group.

As a result manufacturers will concentrate more on European markets, so there will be no let-up in the intense competition even though there should be some recovery in demand.

DRI says the slump stems from the steep fall in purchases by members of the Organisation of Petroleum Exporting Countries (Opec) which in recent years have taken about 40 per cent of trucks exported from Europe. It points out that the situation will have a greater adverse impact on the stronger manufacturers than their smaller rivals.

"The smaller manufacturers, concentrating mainly on the European market, have aleady slimmed to meet the recession. It is their major competitors who now feel the pinch and are in consequence raising the pressure on the European market," the report says.

The fall in export demand from beyond Europe will continue through 1984, DRI maintains. However, output in the five main EEC production countries should recover next year following three successive years of decline.

Output in the five countries (France, Italy, the Netherlands, West Germany and the UK) was 1.44m commercial vehicles of all types in 1980. It fell to 1.2m in the following year, to 1.17m in 1982 and is forecast to fall to 1.14m this year. DRI expects the total to be up slightly at 1.19m in 1984.

Production in West Germany is predicted to fall from 386,000 last year to 342,000 in 1983 before recovering to 370,000 next year. For France the comparative figures are 369,000, 334,000 and 358,000; for the UK 225,000, 237,000 and 234,000; for Italy 149,000, 163,000 and 167,000; and for the Netherlands 11,000, 11,300 and 12,600.

Summing up, DRI says: "A more broadly based recovery will begin in 1984,

"DRI European Trucks Forecast Report," 140 pages. Price $1,400 or £800 from DRI, 30, Old Queen Street, London SW1H 9HP.

Richard Johns looks at the Trans-Sahara gas pipeline proposal

U.S. interest may not be enough

NOTHING could have been more predictable than the welcome given by Mr Donald Hodel, the U.S. Secretary of Energy, to the Spanish proposal for a pipeline linking Nigeria with North Africa and, ultimately, West Europe.

Tension between the U.S. and its European allies over the deal under which the Soviet Union would supply up to 40bn cubic metres of gas via the Siberian pipeline by the end of the decade may have eased with the lifting of Washington's sanctions against the project. But the Administration's hostility and concern over its Allies' dependence on Russian gas remains and the prospect of an alternative must look promising.

Nigeria is one of the more obvious sources of supply to meet the growing requirements of West Europe in the 1990s when indigenous output will be declining. It is, moreover, desperately anxious to get a return on its gas, which is now going to waste.

Nigeria is ranked 12th outside the Communist bloc in terms of proven gas reserves, a quarter of which are associated with oil output. About 90 per cent of current gas production is being flared.

The Spanish proposal, put forward at an International Energy Agency meeting in Paris earlier this month, is for a pipeline running from Spain to Algeria through Morocco, crossing the Mediterranean at the Straits of Gibraltar. A branch line would then run from Algeria to Nigeria.

INITIAL REACTION among senior Algerian officials to the pipeline proposal is very cautious, Francis Ghiles reports from Algiers. Algerian officials say they are interested in the idea, but that many difficulties remain.

The Algerians point to the weak demand for energy in Europe, especially for natural gas. Spain last year only took 1.5bn cubic metres of the 4.5bn cubic metres of gas it had contracted to buy from Algeria and Italy will not be buying the full 12.3bn cubic metres a year which it has agreed to buy from Algeria before 1986.

Meanwhile the 20 per cent premium over market prices which the French have been paying for their Algerian gas will fall to 4 per cent on July 1 when the price of the gas declines to $3.98 per million British Thermal Units. Spain is currently paying only $3.40 per mBtus.

Algeria's fourth European customer, Distrigaz of Belgium is also negotiating a volume cut in the amount of gas it had contracted to buy.

The recent summit between King Hassan of Morocco and President Chadli of Algeria has led to a lessening of tension in North West Africa, but Algerian officials do not believe that the crisis between the two countries over the future of the Western Sahara will be easily or quickly solved. Either of the two routes proposed for the pipeline therefore carries a risk, for the security of the line.

The timing of Spain's initiative was significant, coming only two months after the rapprochement between Algeria and Morocco—a development for which Sr Felipe Gonzalaz, Spain's Prime Minister, could take some credit.

It would almost certainly be more feasible to build a link to Spain across the Straits of Gibraltar from Morocco than over the far longer and deeper seabed route from the Algerian coast to eastern Andalusia which has previously been studied by Algiers and Madrid.

Because transit across the Straits of Gibraltar had been ruled out politically, while also posing as yet unappraised technical difficulties, concentration had until recently been focused on a link between Bani Saf in Western Algeria and Almeria in Spain. Segamo—a joint venture between the Algerian state oil corporation Sonatrach, Enagas of Spain and Gaz de France—finished surveying a route in 1978.

Bechtel completed a feasibility study in 1981, concluding that it would be possible to lay a 120-mile pipeline at depths of up to 7,000 feet with established technology. But no accurate estimate of the cost has been made and the viability of a crossing in the Western Mediterranean is still very much in doubt.

The much shorter Straits of Gibraltar route, of 17 miles at a maximum depth of 900 feet, looks like a much better proposition, especially on grounds of cost. Linking an Algerian-Spanish line to one from Nigeria also makes sense not only for Spain and France but also for Algeria.

The construction of a trans-Saharan facility would also enhance the possibilities of developing the gas resources of the In Salah region of central Algeria.

The idea of a trans-Sahara pipeline was discussed in 1972 by the Algerian Government and ENI of Italy. In November, 1981 the same Bechtel, with an obvious interest in its implementation did an in-house analysis, concluding that such a pipeline appeared sufficiently viable to warrant further study.

According to Bechtel, a 42-inch facility powered by 56 compressor stations and with a design capacity of 1.5bn cubic feet per day could be constructed at a cost of between $8.5bn and $9.6bn.

The lowest estimate related to the most direct route across the centre of Algeria and the highest to the one going via Morocco to the Straits of Gibraltar. It was reckoned that the project could yield a discounted cash flow of 19 per cent on the basis of a well-head price of $1.50 per 1,000 cubic feet plus transit fees through the various countries.

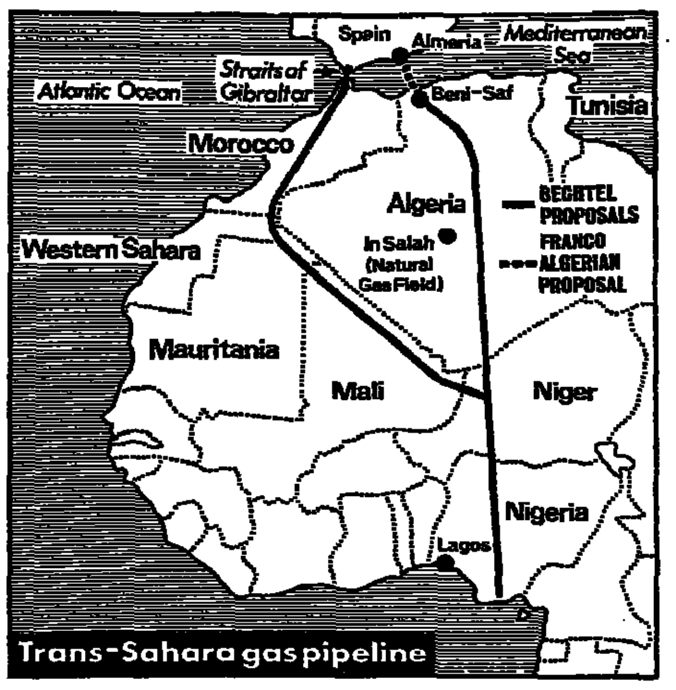
Nigeria has not yet expressed a view about the project. For several years, Lagos has been interested in a Liquefied Natural Gas project under which 1.5bn cubic metres per day, 30 per cent of it associated with production from the Bonny oil field and 70 per cent unassociated, would have been processed for export.

In 1981, when the estimated cost of this project had climbed to between $10bn and $14bn, purchasing commitments had not been obtained and Nigeria itself was running out of money, Phillips Petroleum and British Petroleum pulled out of the project. It was no coincidence that Bechtel did its analysis of the pipeline concept at this stage.

Nigeria is now going ahead with another LNG project half as large as the cancelled one. Technical and financial feasibility studies done by Arthur D. Little and First Boston are understood to be positive and Lagos clearly sets a high priority on going ahead with a scheme that is more advanced than the pipeline idea. Purchasing commitments and financing have still to be arranged, however.

Transporting gas to Western Europe via a trans-Sahara pipeline might prove to be a more economically viable method and also a more secure one if it is assumed that the countries traversed have a vested interest in safe-guarding the facility.

At the same time, however, it remains to be seen whether the Algerian-Moroccan rapprochement, promising though it may be, has yet gone far enough for the project to be considered a serious possibility.



Chinese delegation arrives for oil talks

By Colina MacDougall

THE FIRST delegation to Britain from China's leading Special Economic Zone, Shenzhen, arrives in London today for two weeks of talks with government officials and companies.

Special Economic Zones offer foreign businessmen lower tax rates and special facilities for investment which do not apply elsewhere in China. Shenzhen, one of four so far established, adjoins Hongkong and has attracted substantial investment.

The highlight of the mission's trip will be a briefing with offshore oil companies in England's north-east. Within Shenzhen, a special oil base is planned at Shekou on the west coast, to service the South China Sea offshore oil industry.

About 20 British companies are expected to attend the briefing at Stockton on Tees organised by the North East Development Council next Thursday. These will include companies with experience in rig building and equipment and in supply boats. China's offshore industry is expected to start shortly, following the award of the first exploration contract to BP in early May.

The delegation, led by the vice mayor of Shenzhen, Mr Zhou Ding, was invited by the National Economic Development Council and is sposored by the Foreign Office. It will go first to the north east,

World Economic Indicators

INDUSTRIAL PRODUCTION

(1975 = 100)

					% change over previous year
	Mar. '83	Feb. '83	Jan. '83	Mar. '82	
U.S.*	139.7	137.4	137.4	141.7	−1.4
	Feb. '83	Jan. '83	Dec. '82	Feb. '82	
UK	113.6	103.8	103.6	111.0	+2.3
France	122.0	117.4	118.0	120.8	+1.0
W. Germany	112.5	105.0	108.1	119.0	−5.5
Italy	125.8	116.1	115.0	136.7	−8.0
Netherlands	113.0	106.0	118.0	114.0	−0.9
Japan	96.7	91.1	103.3	98.4	−1.7

* 1967 = 100.

Source (except U.S., Japan): Eurostat

SHIPPING REPORT

Improvement in crude cargo rates from Gulf

BY OUR SHIPPING CORRESPONDENT

INDICATIONS are that there has been a steady increase of crude shipments from the Gulf for both Eastern and Western destinations and that shipping rates have generally tended to improve, reports shipbrokers E. A. Gibson.

Gibson pointed out, however, that much of the ex-Gulf business has been done on a very private basis with the details of transactions impossible to confirm.

Galbraith Wrightson reports that transatlantic rates for coal, grain and ore cargoes remained relatively steady during the week with weaker tendencies in grain shipments from the U.S. to the Continent. Galbraiths cautioned that no clear overall market mood was discernable because Gulf-to-Continent grain shipments had been fixed at lower rates, while Gulf-to-Japan grain shipments had been paid for at higher rates. Coal and ore rates were steady.

Videotex deal for UK company

BY RAYMOND SNODDY

A UK computer services company has won a contract to build and manage a videotex communications link between London and Stockholm for the Swedish Post Office.

From September, visitors to Swedish post offices will be able to call up pages of the latest financial and business information from London on the screens of Postel, the Swedish Post Office's videotex service.

The two-year contract, worth £500,000, has been won by InterCom Videotex (ICV), a subsidiary of Inter Commodities, the independent London commodity brokers.

Mr David Taylor, managing director of ICV, says the contract is essentially to manage a data base for the new Swedish service which will be called Postel International.

The Postel International database will be available throughout Sweden, Norway, Finland and Denmark, using the Nordic telecommunications network. Postel computers will have a 24-hour on-line connection with ICV.

The Swedish contract is ICV's first major international deal but the UK company already provides financial information for videtotex users in the UK, West Germany, the U.S. and the Netherlands. ICV manages Prestel's CitiService for British Telecom. The information provided for CitiService will be available to Postel but ICV hopes that a local database will be built up.

This could include travel timetables and booking systems, electronic banking and local financial information on the Stockholm stock and foreign exchange markets.

BASE LENDING RATES

A.B.N. Bank	10 %	■ Hambros Bank	10 %
Al Baraka International	10 %	Heritable & Gen. Trust	10 %
Allied Irish Bank	10 %	■ Hill Samuel	§10 %
Amro Bank	10 %	C. Hoare & Co.	†10 %
Henry Ansbacher	10 %	Hongkong & Shanghai	10 %
Arbuthnot Latham	10 %	Kingsnorth Trust Ltd.	11 %
Armco Trust Ltd.	10 %	Knowsley & Co. Ltd.	10½%
Associates Cap. Corp.	10 %	Lloyds Bank	10 %
Banco de Bilbao	10 %	Mallinhall Limited	10 %
Bank Hapoalim BM	10 %	Edward Manson & Co.	11 %
BCCI	10 %	Midland Bank	10 %
Bank of Ireland	10 %	■ Morgan Grenfell	10 %
Bank Leumi (UK) plc	10 %	National Bk. of Kuwait	10 %
Bank of Cyprus	10 %	National Girobank	10 %
Bank of Scotland	10 %	National Westminster	10 %
Banque Belge Ltd.	10 %	Norwich Gen. Tst.	10 %
Banque du Rhone	11 %	P. S. Refson & Co.	10 %
Barclays Bank	10 %	Roxburghe Guarantee	10½%
Beneficial Trust Ltd.	11 %	Royal Trust Co. Canada	10 %
Bremar Holdings Ltd.	11 %	Slavenburg's Bank	10 %
Brit. Bank of Mid. East	10 %	Standard Chartered	‖10 %
■ Brown Shipley	10 %	Trade Dev. Bank	10 %
Canada Perm't Trust	11 %	Trustee Savings Bank	10 %
Castle Court Trust Ltd.	10½%	TCB	10 %
Cayzer Ltd.	10 %	United Bank of Kuwait	10 %
Cedar Holdings	10 %	United Mizrahi Bank	10 %
■ Charterhouse Japhet	10 %	Volkskas Intnl. Ltd.	10 %
Choulartons	11 %	Westpac Banking Corp.	10 %
Citibank Savings	¶10 %	Whiteaway Laidlaw	10½%
Clydesdale Bank	10 %	Williams & Glyn's	10 %
C. E. Coates	10½%	Wintrust Secs. Ltd.	10 %
Comm. Bk of N. East	10 %	Yorkshire Bank	10 %
Consolidated Credits	10 %		
Co-operative Bank	*10 %		
The Cyprus Popular Bk.	10 %		
Duncan Lawrie	10 %		
E. T. Trust	10½%		
Exeter Trust Ltd.	11 %		
First Nat. Fin. Corp.	12½%		
First Nat. Secs. Ltd.	12 %		
Robert Fraser	10½%		
Grindlays Bank	‡10 %		
■ Guinness Mahon	10 %		

■ Members of the Accepting Houses Committee.
* 7-day deposits 6.75%, 1-month 7.00%. Short-term £8,000/12-months 9.35%.
† 7-day deposits on sums of: under £10,000 6¾%, £10,000 up to £50,000 7¾%, £50,000 and over 8½%.
‡ Call deposits £1,000 and over 5½%.
§ 21-day deposits over £7,000 7¾%.
‖ Demand deposits 6¾%.
¶ Mortgage base rate.

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WORLD TRADE NEWS

Clouds gather over Chile airline

Europe flights halt may be only the start, writes Mary Helen Spooner

CHILE'S national airline, Lan Chile, is undergoing an extensive study by government authorities to determine its future, after two years of losses totalling more than US$75m, and with this year's losses expected to be about $45m.

Lan attributes its problems to the general slump in the industry and to Chile's economic problems involving the devaluation of the peso. For the three years to mid-1982 the currency was fixed at 39 pesos to the dollar, but it has since fallen to 73.6 pesos.

The airline's fleet, meanwhile, is being reduced. Last year Lan sold one of its three Boeing 707s. It plans to sell the other two this year. This will leave the airline with four aircraft – two wide-bodied DC-10s used for the Santiago-Lima-Miami-New York routes, and two Boeing 737s used for shorter international flights and domestic flights. The DC-10s are leased from Air New Zealand.

The airline recently suspended its flights to Europe, which went from Santiago to Rio de Janeiro, Madrid, Paris and Frankfurt. Lan has insisted that the suspensions were temporary, but it has closed its offices in Paris and Frankfurt. These closures triggered a strike in the Paris office.

The president of the Lan-Chile Workers' Union in Santiago, Sr Alfredo Vila, said the airline had committed itself to handing out U.S.$2m in severance pay to the 200 or so employees laid off by the cuts.

Adding to Lan-Chile's headaches is a suit filed by the widow of Orlando Letelier, the Chilean Ambassador to the U.S., who was assassinated in a car bombing in September 1970 in Washington D.C. U.S. officials have asked for the extradition of three Chilean security officials indicted in the case, but Chile has refused. Earlier this year a U.S. federal judge in New York banned Lan-Chile from taking any of its holdings out of the U.S. until the Chilean Government paid $2.9m in damages.

The ruling ended in legal confusion, however. Since the planes Lan-Chile uses for its Miami-New York flights are leased from New Zealand, the move had no apparent effect other than unfavourable publicity. The Lan-Chile flights between Santiago and the U.S. have continued without interruption.

The airline's problems have a touch of irony, given Lan-Chile's recent history and accomplishments. According to Sr Gustavo Gutierrez, the public relations director, the company changed itself from being a heavily subsidised and inefficient enterprise in the early 1970s to a profitable airline by 1980.

Lan-Chile won safety prizes in 1979, 1980 and 1981, and the International Air Transport Authority (IATA) has given Lan-Chile a 93 per cent punctuality rating. IATA has also ranked Lan-Chile among the top 15 airlines in the world in respect of productivity per employee on an airline mileage count.

Part of the problem with Lan-Chile's former European flights, Sr Gutierrez said, was the disadvantage it faced in competition with European airlines.

Lan-Chile hopes to resume its European flights by 1985.

Timken order set to go after 33 years

By William Hall in New York

THE U.S. Justice Department has tentatively agreed to lift a a 33-year-old court order which prevents the British and French operations of Timken, one of the world's biggest producers of tapered roller bearings, from fixing prices or dividing up the world market.

The Ohio-based group is the biggest producer of roller bearings in the U.S. and the court order dates back to a civil antitrust suit which charged that Timken had conspired with British Timken and Société Anonyme Français Timken to divide up the world market for antifriction bearings. These are the company's main product and used widely in the world car and truck industries.

At the time the order was filed Timken owned only 30 per cent of the UK company and 50 per cent of the French company. Since then it has acquired full control of both, and in the late 1950s they became divisions of the parent company.

Mr William French Smith, the U.S. Attorney General, said on Friday that the Government's tentative agreement was contained in a stipulation filed in the U.S. district court in Cleveland. The public have 60 days to comment on the proposal.

STATISTICAL TRENDS: EMPLOYMENT

The grim spectre of unemployment

THE HIGH rate of growth forecast for the world labour force over the next 20 years carries a grim implication of rising unemployment. Even the industrialised countries, with lower population growth in prospect, seem certain to *experience high levels of unemployment.* With higher population growth, the developing countries face even greater *difficulties.*

In the OECD economies the main change in employment structure over the past two decades has been the rise of the services sector. This has gone hand in hand with the growth of governments' share in employment. On average, over the whole OECD, the governments' share grew by *55.4 per cent over the period* 1960-80. This figure hides wide differences between member countries with *Sweden showing an increase* of almost 2½ times, while in the U.S. the government's share barely grew.

Participation rates are continuing to rise in most major industrialised economies. The major exception is the UK which recorded falls in each of the past two years. The relatively low figure for Italy may be partly explained by its large proportion of unrecorded employment.

Commentary by Our Economics Staff: data analysis by Financial Times Statistics Unit; charts and graphs by Financial Times Charts Department

The relative dominance of large-scale industry is reflected in the figures for employment status. Countries with the highest proportion of self-employed tend to be those with relatively large percentages employed in agriculture, forestry and fishing.

The speed with which unemployment has grown in major industrialised countries is a product not only of a decline in the number of jobs but also of sharply increasing labour forces as the 1960s "baby boom" comes of age. This latter trend will continue through the 1980s becoming, perhaps, the dominant influence on unemployment levels.

The rate with which unemployment benefit replaces previous disposable income varies considerably. The "*typical worker*" *is defined* as a male production worker in manufacturing industry, married to a non-working wife with two children.

This definition is actually untypical in a statistical sense. In 1980 it accounted for only 15 per cent of total unemployment in Finland and 10 per cent in the UK. The "average unemployed" definition takes into account the high levels of youth and female unemployment, and *where it is possible to calculate* disposable income replacement rates on this basis, very different results occur.

Working hours are subject to the various influences of both long and short-term labour supply and demand trends. In the short term fluctuations in product demand are increasingly reflected in working hours, through overtime, shift work, etc. However, most industrialised countries have experienced a relatively strong decrease in annual working hours averaging out at about −0.7 per cent over the past two decades.

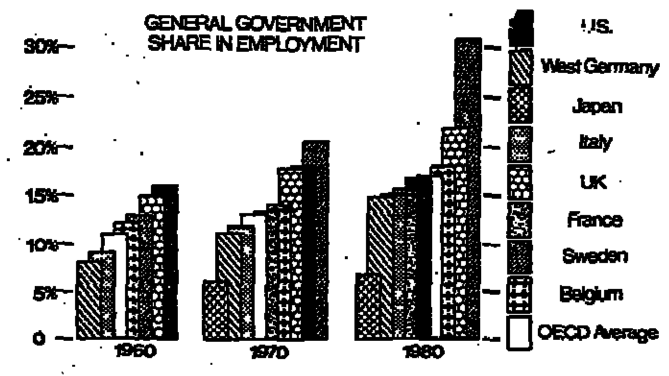
Since 1970 part-time jobs have increased between two and four times as rapidly as *total employment. The OECD* estimates that between 80 per cent and 95 per cent of these were filled by women (in 1977, 20-25 per cent of all women in the labour force worked part-time). Most of these jobs were created between 1970-73 (*except* in the U.S.); and in the following years the share of part-time jobs levelled off. More recently a new increase seems to have occurred. The proportion of jobs which are part-time varies between OECD countries from less than 10 per cent (Finland, Ireland, Italy) to over 40 per cent (Denmark, Norway, Sweden, UK) and is usually related to the labour force participation of women.

WORLD LABOUR FORCE

	Average Annual Growth (%) 1960-70	1970-80	1980-2000	Structure 1980 (%) Agricul.	Indust.	Services
Low income Economies	1.6	2.2	1.9	71	14	15
Middle income Economies	2.0	2.3	2.6	44	22	34
Industrial market Economies	1.2	1.3	0.7	6	38	56
Non-market industrial Economies	0.7	1.2	0.6	16	45	39

Source: World Bank

General



GROWTH RATES OF PUBLIC AND PRIVATE SECTOR EMPLOYMENT

	1960-65 Pub.	Priv.	1965-70 Pub.	Priv.	1970-73 Pub.	Priv.	1973-78 Pub.	Priv.
U.S.	2.9	1.5	3.9	1.9	1.0	3.5	1.3	2.2
Japan	na	na	na	na	2.7	3.2	3.1	−0.2
W. Ger.	4.6	0.1	2.5	−0.5	5.0	−0.6	3.1	0.3
France	−0.5	0.7	2.2	0.7	3.8	−0.4	1.8	−1.6
UK	−0.1	1.0	2.5	−0.9	3.1	−0.3	1.7	−0.5
Sweden	4.5	0.2	6.9	−0.5	3.6	0.6	1.7	−2.0
Austria	2.0	−0.4	2.5	−1.2	2.4	0.5	2.9	−0.7

Source: OECD

PARTICIPATION RATE*

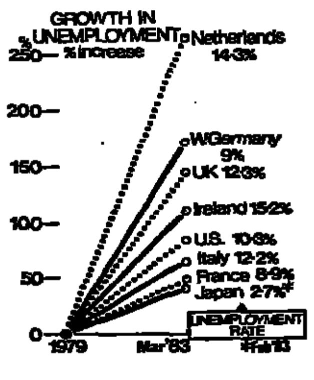
%	1979	1980	1981	1982
U.S.	46.7	47.0	47.3	47.5
W. Germany	43.0	42.8	43.5	43.6
Japan	48.3	48.4	48.5	48.8
France	42.0	42.2	42.5	na
Italy	38.6	39.0	39.4	39.5
UK	47.0	47.1	46.8	46.4
Sweden	51.4	51.9	52.0	52.3

* Civilian labour force as a proportion of population.
Sources: OECD, Eurostat

EMPLOYMENT STATUS 1980

%	Employees	Self employed	Unpaid family workers
U.S.	90.6	8.7	0.7
Japan	63.2	13.7	22.9
W. Germany	86.2	9.6	4.3
France	82.9	17.1	
Italy	73.0	15.9	11.1
Canada	90.1	8.7	1.1
UK	96.2	3.8	—
Ireland	74.3	22.2	3.5

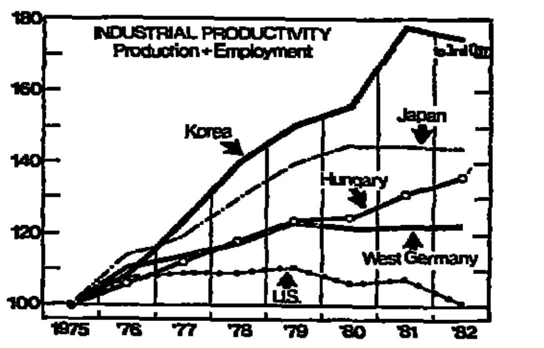
Source: OECD



UNEMPLOYMENT BENEFIT: RATE OF DISPOSABLE INCOME REPLACEMENT* (%)

	1972	1974	1976	1978	1980
"Typical worker"					
W. Germany	70.0	70.4	73.3	71.5	69.0
France	84.7	89.0	90.6	91.6	93.8
Italy	43.6	41.4	43.6	46.4	46.7
Denmark	82.5	88.2	89.7	90.1	95.0
Finland	58.2	57.9	57.7	54.5	45.4
UK	na	62.4	64.3	58.9	48.2
U.S.	58.9	60.1	59.9	60.7	61.4
"Average unemployed"					
Finland	na	76.1	76.0	69.3	56.0
UK	na	51.5	52.5	51.7	42.1

* Unemployment benefits as a per cent of former disposable income.
Source: U.N.



Hours and Earnings

INDUSTRIAL STOPPAGES
Working days lost per 1,000 employees, all industries and services

	Annual average 1972-76	1977-81	1981
U.S.	446	409	370
W. Germany	17	29	3
Japan	170	28	14
UK	491	571	197
France	236	145	86
Italy	1,485	950	588
Canada	1,113	776	899
Netherlands	4	30	6

Source: Dept. of Employment

ACTUAL HOURS WORKED PER PERSON IN EMPLOYMENT
% annual growth

	1970-73	1973-76	1976-78	1978-80
U.S.	−0.04	−0.90	−0.15	−0.65
Japan	−0.35	−0.70	0.32	−0.43
W. Germany	−1.41	−0.75	−1.50	−0.84
UK	−0.29	−1.12	−1.06	−1.53
France	−1.02	−1.74	−1.27	−0.24
Italy	−2.23	−0.58	0.11	−0.89
Belgium	−1.53	−1.42	−1.08	−2.92
Canada	−0.33	−1.24	−0.59	−2.33

Source: OECD

WEEKLY HOURS WORKED PER EMPLOYEE 1979

	Industry	Services
W. Germany	41.0	41.7
France	41.7	41.7
Italy	40.5	38.8
UK	41.5	40.6
Netherlands	39.7	38.9
Belgium	40.1	39.1
Denmark	38.1	39.6

Source: Eurostat

EARNINGS AND LABOUR COSTS† IN MANUFACTURING
Hourly averages for production workers ($ U.S.)

	1975 Earnings	Lab cost	1982* Earnings	Lab cost
U.S.	4.83	6.35	8.50	11.73
W. Germany	3.97	6.19	6.01	10.38
Japan	2.66	3.05	4.98	5.80
France	2.71	4.58	4.37	7.96
Italy	2.33	4.60	4.03	7.44
UK	2.64	3.27	4.95	6.73
Korea	0.31	0.37	1.06	1.25
Brazil	0.90	1.13	2.08	2.60
Mexico	1.44	1.92	1.97	2.73

* Provisional. † Includes employers' contributions.
Source: U.S. Dept. of Labor

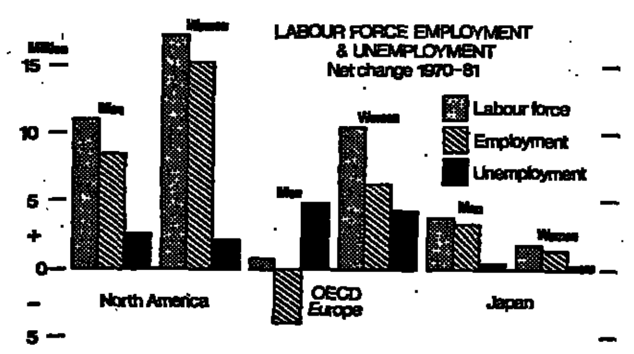
Women

FEMALE SHARE OF EMPLOYMENT AND UNEMPLOYMENT 1982

%	Employment	Unemployment
U.S.	43.5	42.1
Japan	39.0	38.2
W. Germany	38.4*	44.3
France	38.3*	57.1
Italy	32.5	55.6
UK	41.1	35.5

* 1981.
Source: OECD

Youth



YOUTH UNEMPLOYMENT
March 1983

	% of labour force of same age	% of total unemployed
W. Germany	14.9	23.4
France	26.5	39.5
Italy	34.2	47.4
Netherlands	35.0	38.2
UK	27.6	37.6
Denmark	33.9	29.0
Belgium	32.6	36.0
EEC (10)	26.4	36.8

Source: Eurostat

DURATION OF YOUTH UNEMPLOYMENT AT OCT. 1982
EEC (9) (% of total)

Under 3 months	37.6
3-5 month	18.5
6-11 months	19.0
Over 12 months	24.9
Total	4,776,000

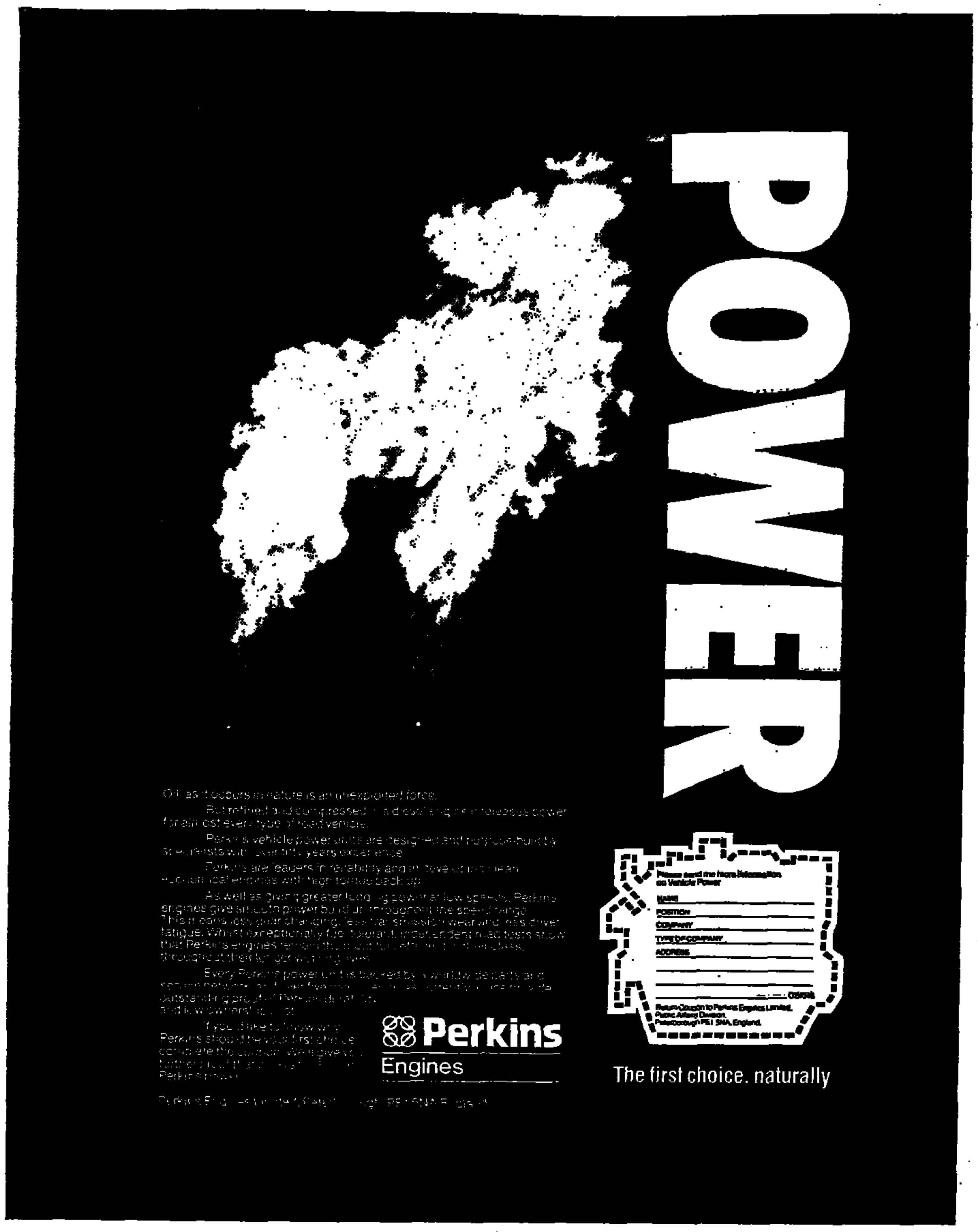
Source: Eurostat

Motor Industry

EMPLOYMENT IN MOTOR VEHICLE INDUSTRY
Annual % change

	1977	1978	1979	1980	1981	1982
W. Germany	5.5	3.6	2.7	1.8	−1.8	0.1
France	0.8	0.7	−1.4	−3.6	−7.6	−2.9*
Italy	0	1.3	4.6	0.7	−4.2	−4.9*
UK	5.7	0.4	−2.6	−10.8	−17.1	−11.8*
Belgium	1.4	1.3	3.8	−0.5	−9.6	−3.7*
EEC (9)	3.3	1.7	0.7	−2.6	−7.1	−3.7

* First three quarters.
Source: Eurostat



UK NEWS

Lloyds near to finalising Multi-Guarantee fund

BY DOMINIC LAWSON

LLOYDS of London is in the final stages of setting up a fund to protect the holders of extended warranties marketed by Multi-Guarantee, which went into liquidation last Friday.

Manufacturers and retailers used the Multi-Guarantee scheme to extend the normal one-year guarantee on household goods to four years.

The company directed its insurance through a non-Lloyds broker, which passed it to a Lloyds broker, Robert Morris Bray, which transmitted the premiums to Lloyds underwriters.

The fund, which will comprise monies paid as premiums to Lloyds underwriters, is intended to provide sufficient cover during the period in which the Lloyds working party investigating the affair completes its work.

It is thought that the working party, announced last month, will take another two to three months to deliver its findings.

Lloyds said yesterday "there has been talk of the fund being worth about £5m. That seems rather on the high side."

Lloyds began its investigation of warranty scheme, when it was discovered that documents sent back to underwriters had been changed, and the terms altered.

A Lloyds spokesman said "This involves the Office of Fair Trading and the Department of Trade. Clearly there is apossibility of fraud."

He added "The working party will try to find out if Lloyds has done anything wrong in terms of our own rules.

"Against the background of what went on last year at Minet and Howden, we have got to be seen to do the right thing on this one, although the eventual losses may involve no more than £1m."

Multi-Guarantee went in to liquidation voluntarily on Friday, at the request of its shareholders. With the support of Lloyds the Official Receiver was appointed as liquidator, and Mr Bill Mackey of accountants Ernst and Whinney to manage the business.

STC wins £29m telex contract

By Jason Crisp in London

STANDARD Telephones and Cables has won a £29m order from British Telecom to supply it with electronic telex terminals. In the last 15 months BT has ordered a total of £59m of these terminals from STC.

The demand for advanced telex terminals (teleprinters) has been very strong since their introduction in the UK. The teleprinters are much quieter and easier to use than the old electro-mechanical telexes.

STC supplies BT with the Cheetah, which has a number of facilities including a visual display screen which has a number of facilities including a visual display screen which can be used like a word processor. Trend, a company based in High Wycombe, also supplies BT with teleprinter, which is sold as the Puma. To date Trend has received £15m orders from BT.

● Burroughs, the U.S. computer group, plans to expand its product development plant at Livingston in Scotland, which is expected to increase employment by at least 200 jobs over the next two to three years.

The company currently employs 320 people

BA to reorganise Shuttle services

BY ELAINE WILLIAMS IN LONDON

BRITISH AIRWAYS is planning a major reorganisation of its walk-on London-Scotland Shuttle services in the light of continuing losses of passengers to rival services.

In February, Mr Colin Marshall, BA's new chief executive, set up the Marketing Policy Group to look at ways in which BA could improve its customer services.

It was no secret at that time that the Shuttles were under scrutiny with their very basic service to passengers losing out to newcomer British Midland Airways' alternative, which is £5.50 cheaper than BA's £58 fare and which offers passengers cooked breakfasts or other meals and a bar service on Scottish routes.

Until BA's monopoly of the Scottish routes was ended last year following British Midland's successful application for an operating licence under the Government's 'open skies' policy, BA made an operating profit of about £6m on all its Shuttle routes.

This has been cut dramatically by British Midland's entrance and the existing rail competition and by British Caledonian's flights to Scotland from Gatwick Airport.

British Midland started flying the Heathrow and Glasgow routes last October and introduced scheduled flights to Edinburgh two months ago. Since then it has captured an estimated 30 per cent of the market.

BA carries about 800,000 passengers on its Scottish services, and more than 2m people on its four Shuttle routes.

Among the possibilities the British Airways 'think tank' are studying to win back its lost customers are the introduction of a meal and bar service, a reduction in fares to meet British Midland, the facility for passengers to book seats in advance so ending the concept of a walk on service, and an end to the payment of fares in flight.

BA remains cautious about its options for the Shuttle services and denies that there is any likelihood that the services will be scrapped altogether.

● On Wednesday a new airline will enter the top end of the air travel market. It is Birmingham Executive Airways, which will begin daily services to Milan, Copenhagen and Zurich in June. These routes were given up by British Airways in 1982.

The new airline hopes to make a profit on these routes by using 18 seater Jetstream 31 twin turboprop executive aircraft. BA used 99 seater aircraft.

Sizewell inquiry moves to London

Financial Times Reporter

THE Central Electricity Generating Board's case for Sizewell B pressurised water reactor (PWR) has emerged bruised but still intact after the first 16 week term of the public inquiry, which now moves to London.

Following nearly three months in which it completed the presentation of its case, the CEGB evidence on the economic advantages of going ahead with the PWR has been the main area of challenge.

On a construction cost basis, the PWR at £1.147bn compares favourably with the coal fired plant, at £1.245bn and would be considerably cheaper than an advanced gas cooled reactor, at £1.59bn.

The capital costs of the PWR and the coal fired station are likely to move closer together as a result of delays and the expense of design changes for Sizewell B, more of which may be necessary to satisfy the Nuclear Installations Inspectorate (NII).

But the CEGB has pointed out that the net effective costs of the three options must be seen in the light of many other factors, including running costs, waste disposal, decommissioning and fuel costs.

A large part of the CEGB's economic argument for the PWR is based on forecasts of rapid rises in the cost of fossil fuels during the foreseeable future.

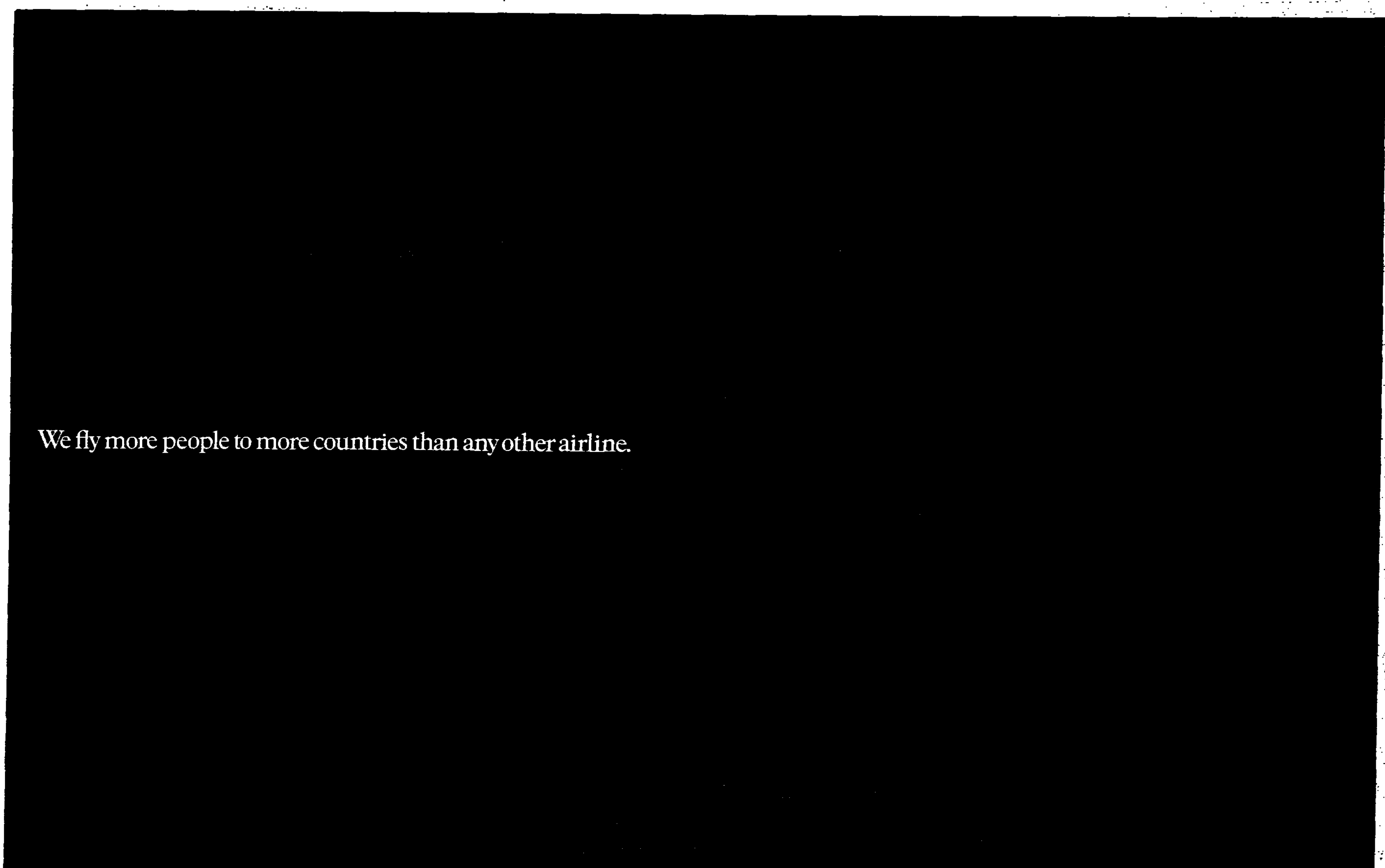
The National Coal Board has told the inquiry it believes that prices will rise less steeply than the CEGB has suggested and recent forecasts tend to support this view.

However, the CEGB also believes that a diversity of fuel supply is a powerful economic argument for a nuclear choice.

The CEGB admits that the new stations will not be needed for several years on capacity grounds, but believes it will be an advantage to construct the station in advance of need, so that savings can be made by closing older uneconomic plant.

Current plans are for a start on the main foundation for Sisewell B in April 1985 and the commissioning of the station in the autumn of 1992.

The CEGB and the NII are still working to resolve a large number of safety issues.



Forecasts fail to beat the market

By Jeremy Stone

FOREIGN exchange forecasting services in the UK do not seem to be very successful in helping their customers to "beat the market." In most cases, according to a study in the City University's new Economic Review investors would do better – sometimes much better – if they were to follow a passive policy of buying and selling in the forward market on the principle that the forward price ought to be the best predictor of future spot prices.

The international working party on exchange market intervention – set up after the Versailles summit – recently found that "readily accessible information on inflation and interest rate differentials" gives a better predictor of spot rates than do forward rates. So it looks as if there could be something badly adrift in the British forecasting services studied by the City University Business School.

The six major forecasts studied were almost uniformly bad at predicting correctly whether the currency would go up or down, and also at getting on the right side of the market (so that the forecast and the eventual spot rate are both more, or both less, than the forward rate).

Flipping a coin would tend to pick the right direction of change half the time, but over a three-month horizon only one forecaster managed a 50 per cent record in even a single currency (the Yen) out of the five being forecast. The overall performance of the forecasts was discouraging.

For a forecast to be used profitably in opening forward positions it has to be on the "right side" of the forward rate. But results here were also disappointing, with today's spot rate being the best predictor of the spot rate a year hence for every currency except the Italian lira.

On the other hand, the margin of error in the forecasts was sometime respectably small. Even though the worst of them was likely to be 10 times as far from the target as the three-month forward rate (for sterling-dollar rates), the best were able to beat the forward rate over a twelve-month horizon. However, the researchers point out that this is chiefly due to a deterioration in the forecasting accuracy of the forward rate.

Short-term recovery predicted in engineering

BY ALAN PIKE

MECHANICAL engineering output is forecast to increase by 7 per cent from the middle of this year to the end of 1984.

But the latest mechanical engineering short-term trends, published today, stress that "the forecast increase in output during the next 18 months will no more than make up for the reduction in output which has occured in the last 18 months."

Under the forecasts contained in the trends, output volume in the final quarter of next year would be at the same level as in the first quarter of 1983. The forecast level of output volume for 1984 is about 18 per cent below the 1979 level.

Mechanical engineering output trends have been almost continually downward since the beginning of 1976. While the forecast now suggests a period in which the trend will be upward, the short-term trends working party warns that "this short-term recovery does not necessarily imply that the longer term downward trend has been halted."

The working party – consisting of employer, trade union and Government representatives – bases its assumptions for mechanical engineering on the view that UK manufacturing as a whole will increase by about 3½ per cent between 1982 and 1984, compared with a reduction of 15 per cent between 1979 and 1982.

So far as individual sectors are concerned, the working party expects substantial growth in output in instrument and electrical engineering, and possibly printing and publishing and chemicals. By contrast, it expects output to "decline substantially in shipbuilding and marine engineering and less severely in the metal manufacture and textile, leather and clothing sectors."

The working party expects the recent low level of export volume to pick up and possibly lead to an increase in the volume of export shipments between 1983 and 1984. It has modified previous pessimistic statements about export potential to the oil-producing countries, and now believes that their demand for UK mechanical engineering products will not decline as seriously as was feared.

Mechanical Engineering Short Term Trends, subscription only, Engineering Employers federation, London.

Unemployment 'could halve' says new economic study

BY JEREMY STONE

BEFORE the end of the 1980s the rate of unemployment in the UK is likely to be halved whoever wins the general election next month, according to Professor Michael Beenstock and his colleagues at the City University Business School.

They say this will happen because a spontaneous recovery in employment and output is in prospect, as real wage growth moderates in response to slackness in the labour market.

This view is embodied in a new model of the UK economy, which concentrates more than most previous models on the "supply side" of the economy, assuming that in the long run the level of output depends more on what producers find it profitable to produce than on the amount of output demanded.

Thus, the recession since 1979 is held to be mostly the result of influences depressing the supply side, when rapid increases in the cost of labour, energy and capital, and a rising exchange rate kept profitability at very low levels, reducing the private sector's desire to produce. By comparison with these forces, says the Beenstock team, the demand side effects of tight money since 1979 "look ordinary."

For this reason, Keynesian policies for expanding demand are regarded as inappropriate means for bringing about prolonged recovery; demand was not deficient.

The model is intended to give projections over a long period, and various scenarios are set out, running until 1995.

The Economic Review, City University Business School, Frobisher Crescent, Barbican, London.

Aurora financial reconstruction plan to be redrawn

BY RAY MAUGHAN

PLANS which had reached an advanced stage for the £20m financial reconstruction of Aurora, the Sheffield-based engineering, castings and forgings group, will be redrawn this week following a substantial undershoot of the aid envisaged from the public sector.

Details of a reconstruction package were expected to be announced this week, but it is now understood that the Department of Industry has committed only the minimum aid required under the Industries Act 1971.

The private sector participants, which are believed to include the National Coal Board Staff Superannuation Scheme and Finance For Industry among half a dozen leading institutions, had hoped that the department would extend, or "stretch" the provisions of the Act and commit about £2m to the scheme. Instead, the Government has decided to provide only £250,000 in grants and special aid.

This decision was described last week as a "psychological blow" to the private sector in relation to joint City and public sector re-financing proposals for industrial companies. It contrasts sharply with the formation last year of Sheffield Forgemasters from the special steels divisions of both the British Steel Corporation and Johnson Firth Brown.

On that occasion, it was evident that the public sector was quite prepared to lead the way while the contribution from City of London institutions was much delayed and only committed towards the end of the negotiations in piecemeal sums.

Aurora has a severe balance sheet deficiency. Under the terms of the Companies Act, 1980, it was required to seek shareholders approval for a substantial increase in its borrowing limits in anticipation of the equity and grant transfusion from the consortium of City and Department of Industry interests.

CSI and banks to meet on disclosure rules

BY CHARLES BATCHELOR

THE Council for the Securities Industry (CSI), the City's main self-regulatory body, and representatives of the merchant banks will try again on Wednesday to agree rules for the disclosure of substantial holdings by the banks in companies.

The two sides disagree over how the banks should treat shares, held in discretionary accounts for clients, which add up to 15 per cent or more of a company's equity.

The banks believe that unless the owners of the various holdings are clearly acting as a "concert party" to gain control of a company, they should not be required to disclose their holdings.

The Association of Investment Trust Companies, one of whose members claimed a large holding of this kind was being used to exert pressure on it, has called for a stricter interpretation of the rules on acquisitions of shares.

Savings receipts still down

By Jeremy Stone

TOTAL net receipts from National Savings in April were an estimated £179.2m, including accrued interest. This is £58.6m higher than in March, but falls well short of the average monthly inflow in the last financial year of £246m.

The main net contributions to funding came from fixed-interest National Savings Certificates (£114m), National Savings income bonds (£60m) and National Savings Bank investment accounts (£25m). Premium Bonds made a net contribution of £10 and the NSB ordinary account (£7m).

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BTR should not profit from Tilling – you should.

STAY WITH TILLING AND PROFIT.

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Tebbit spells out more employment changes

BY JOHN LLOYD, LABOUR EDITOR

MR NORMAN TEBBIT, the Employment Secretary, has spelled out a further series of sweeping changes in employment law to take effect if the Conservatives win the general election.

Mr Tebbit enlarged on the indications given in the Conservative manifesto, published last week and stressed his belief that in the event of a Tory victory, the trade unions would "do some fundamental rethinking" on their present attitude of non-cooperation.

He repeated his willingness, first stated last December, to "move over" if it was "thought after an election that for the unions to come to a rapprochment, they should talk to someone other than me." He mentioned Trade and Industry and the Home Office as preferred choices of department – but said that he would enjoy carrying forward the considerable legislative programme planned for employment.

This will include:

- The need to hold strike ballots – not necessarily postal ballots but "fair and free" – before any union calls a strike, whether local or national.

If there were no ballot unions would lose immunities granted under section 29 of the 1974 Trade Unions and Labour Relations Act, and their funds would be at risk.

- A "specifying" of some industries and services as "essential" and the requirement in these services to stick to procedure agreements on pain of loss of immunities. Mr Tebbit said that the number of essential services or industries would probably be "narrowly drawn" – but could include the public and private sectors. A green paper discussion document will be issued before legislation.

BRITAIN GOES TO THE POLLS JUNE 9

- legislation to ensure that union members have "effective choice" on payment of the political levy – though Mr Tebbit said that "if the unions are willing to talk on how to put these abuses right there may be no need to legislate."

He said that "the simple and clean-cut solution would be to return to "contracting in" to the political levy (presently a member must "contract out" of payment) but we have listened to what the Labour Party and the unions have said and we wouldn't want to wreck a political party lightly." Earlier possibilities of bringing in state aid for parties now seem remote.

- The existence of a political fund will require periodic endorsement – probably once every ten years – by union membership in a ballot.

- The granting of a right to all union members to elect their union's governing body by ballot. The right would be permissive, not prescriptive – "if it were abridged or denied it would be for the trade union members concerned to bring an action in the courts."

Mr Tebbit is not attracted to legislation to allow companies to lay off workers without pay because of the effects of strikes elsewhere in industry – though he says he will keep it in reserve if the industrial relations climate deteriorates. He also presently does not favour legislation to decentralise wages, preferring the route of privatisation of services or parts of services – as the National Health Service.

Of his period as Employment Secretary, he said that he was able to introduce changes because "public opinion was ready for them – though I helped to create that opinion. A lot of people had been noticing that the emperor had no clothes but it was up to some rude fellow to point it out."

Labour pledge on U.S. N-bases

By Ivor Owen

DISCUSSIONS aimed at securing the introduction of a new strategy for Nato would precede any decision by a Labour Government to close United States nuclear bases in Britain, Mr John Silkin, Labour's Shadow Defence Minister, stated last night.

Insisting that there was no question of U.S. forces being given their marching orders to leave Britain as soon as Labour Ministers took office, he declared that nobody in his right senses would decide such issues overnight.

Mr Silkin, replying to questions in a television programme on nuclear weapons policy, stressed: "There are always discussions and there are always negotiations."

Mr Michael Heseltine, the Defence Secretary, accepted that there was "very serious unease and anxiety about the whole nuclear issue" but claimed that the overwhelming mass of voters in Britain still supported the policy followed by successive British Governments since the Second World War, based on membership of Nato and the need for "a nuclear backing" for the conventional forces.

Dr David Owen, for the SDP-Liberal Alliance, warned that the negotiations with the Soviet Union, in which the Nato powers sought an arms reduction deal, which made it unnecessary for U.S. Cruise missiles to be deployed in Europe, would be "tough."

He underlined his preference for Nato adopting a nuclear weapons policy based on "no early use" rather than a "no first use."

OPINION POLLS STILL GIVE THE CONSERVATIVES A FIRM LEAD

Charting the parties' progress

BY PETER PULZER

IS IT moving or isn't it? It sounds like the Inquisitor's question to Galileo, and the best one can do is to opt for the ambiguous mumble that the great man thought it prudent to offer to his tormentors.

In the middle of last week it looked as though there was some movement: there seemed to be more single-figure opinion poll leads than double-figure for the Conservatives over Labour. However, the 13 per cent Marplan lead in yesterday's Sunday Mirror and the 15 per cent MORI lead in the Sunday Times, appear to have put paid to that, compared with only one single-figure lead, the 9 per cent recorded by Harris/ORC for The Observer.

There are a number of difficulties in disentangling these clues. The first consists of comparing like with like. The order of publication does not always coincide with the order of field work; MORI's interviews, for instance, were done on Tuesday and Wednesday, Marplan's on Friday. The frequency with which each organisation takes its polls also varies, and since addicts have come to know each of the organisations' little idiosyncrasies one should ideally compare one NOP with another.

As an example, during the 1981 surge for the Alliance, Gallup tended to report somewhat higher ratings for it than other polls, but the trendlines were on the whole parallel. Moreover, Gallup, unlike its rivals, often asked an "Alliance reminder" question, in addition to offering Liberal and SDP choices, which generally produced slightly different answers. So the safe thing to do was to compare Gallup with Gallup and not to draw one graph with figures from every organisation.

OPINION POLLS RESULTS

Poll and date	Sample size	Cons	Lab	SDP Lib %	Others	Cons lead
Range of eight taken May 5/12 1983		45/52	31/38	15/21	0/2	9/21
MORI (Standard) May 5/11	1,824	46	32	22	0	14
Gallup (Telegraph) May 11/16	946	46	33	19	2	13
MORI (Star) May 16	1,090	44	37	17	2	7
Audience Selection (TV-am) May 16	1,154	46	31	21	2	15
NOP (Mail) May 16/17	1,584	49	31	19	1	18
Audience Selection (Sun) May 17	507	44	33	21	2	11
MORI (Express) May 19	1,100	46	37	16	1	9
Harris Research (TV-Eye) May 17/18	1,053	45	35	17	3	10
MORI panel (Sunday Times) May 17/18	960	47	30	21	2	17
Harris Research (Observer) May 19/20	1,052	45	36	18	1	9
Marplan (Sunday Mirror) May 20	1,250	47	34	18	1	13
General Election May 3		45	38	14(Lib)	3	7

A further obstacle is that there is more than one method of choosing a sample. Purist statisticians prefer random sampling (i. e. taking every 500th name on the electoral register), but this is slow and expensive. Most polls now use quota samples, which leaves more discretion to the individual interviewer.

Recently telephone polling has come back into favour, after a long period of discredit. Telephone polling got a bad name in 1935 when the Literary Digest of America, having polled its members, forecast the defeat of Roosevelt, having got the result right four years earlier. Since readers of the Literary Digest and telephone users were predominantly middle class, what had been a politically representative sample before the New Deal had ceased to be one four years later.

However, a telephone poll forecast the result of the Bermondsey by-election quite accurately. The reason for this may be partly because most people now have telephones, but also because polling organisations now know how to compensate for any distortions that their methods may introduce.

Bearing this is mind, it is possible to trace the movements of opinion in the first ten days of the campaign. Thus it appears that since the announcement of the election the gap between Labour and Conservatives has narrowed slightly, while the Alliance's position has remained unchanged. The earlier Labour surge, which gave it its relatively good local government election results, however, has come to an end.

This is likely to give little comfort to the opposition parties. But opinion polls ask more than "how would you vote?" questions, and the answers to some of these are a little more cheering to Labour and the Alliance.

The Liberal/Social Democratic Party Alliance parties have always argued that it is campaign exposure that will give them the lift in the polls that they expect, as did indeed happen in 1964, 1974 and 1979, when the Liberals' ratings rose substantially in the final stages of the campaign. Alliance voting intentions at the moment remain obstinately flat, but their leaders' ratings have risen perceptibly, as, to a lesser extent, have those of Mr Michael Foot, the Labour leader.

On issue handling, the message is more mixed. The Alliance shows small rises on six issues, including unemployment and public services (Harris: Weekend World) and on the EEC and defence (MORI). Labour is also up on unemployment and public services (Weekend World), but down, though still ahead, on these topics according to MORI. But both polls report the Conservatives gaining on a greater number of issues than either of the other parties.

What the verdicts on issues signify is a general hardening of commitments as the campaign progresses, rather than shifts in allegiance. The proportion of electors who have still to make up their minds is now under 20 per cent according to all the polls that ask that question. That leaves both Labour and the Alliance fewer votes to play for – unless of course, those who think they have made up their minds turn out not to have done so.

The author is tutor in Politics at Christ Church, Oxford.

Fears on competitiveness lead to NEDC document delay

BY JOHN LLOYD

THE NATIONAL Economic Development Committee's controversial review of economic performance, publicised by Mr Neil Kinnock, Labour education spokesman over the weekend, is indeed an exceptionally gloomy document.

The document shows that:

- unemployment, roughly the same as the OECD average until 1979, took off sharply since then, increasing by 75 per cent compared with the OECD average of 33 per cent;
- the UK invests less than its competitors, and its capital productivity is lower;
- unit labour costs have risen sharply compared to competitor countries, especially between 1977 and 1980;
- productivity performance has been barely half the OECD average;
- UK spending on research and development is lower than in any other major economy;
- the UK Government spends less on education and training than any other major European country.

These trends, many of which appear unchanged or have even worsened during the Government's term of office, stand in contrast to Conservative claims that an upturn is now under way.

However, Mr Kinnock, who has reportedly only seen the minutes of the March NEDC meeting which discussed the review, appears only half right about the status and future of the document, and all concerned with the NEDC have expressed surprise that it should have become such a live election issue.

First, it is a review of past performance, stopping at 1982. In some respects, it offers small bits of cheer – as in the section on unemployment, which notes that the UK rate of increase in 1982 was lower than the OECD average.

It also shows that wage inflation has fallen sharply since 1980, and that the annual rate of change is equal to that of the U.S. and West Germany.

Second, while it is a fact that Sir Campbell Fraser, President of the CBI, said the review was "so gloomy that people would want to get the first boat out of the country," it appears that there has been no deliberate attempt at suppression.

The document had been agreed at staff level by Government, CBI and TUC, but the tenor of it caused the CBI to push for a two-month delay, while the NEDC staff added recommendations, to it on what should be done to improve performance.

These recommendations should have come to the Council meeting earlier this month, but were apparently not prepared in time – a fact which is not thought to have caused great dismay among any of the NEDC's partners.

The minutes of the meeting show that Mr Geoffrey Chandler, the NEDC's director general, expressed concern that a document which had been agreed at staff level should be "called off at a higher level." However, the reason for the delay, as far as can be ascertained, appears to have been the CBI's fears of its effect on UK competitiveness rather than Government fears of its effect on a forthcoming election.

Alliance terms outlined

By Peter Riddell

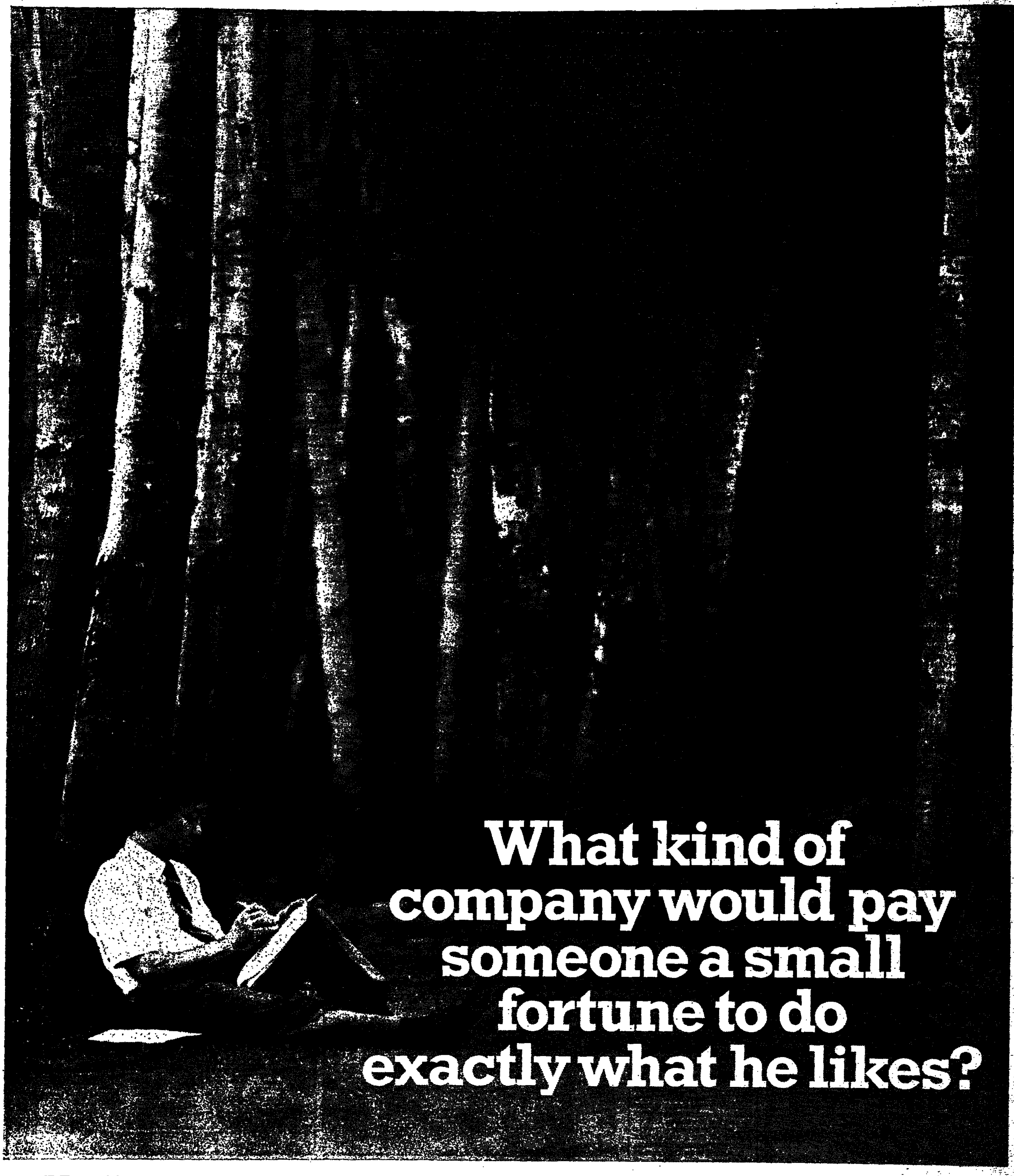
MR Roy Jenkins, the leader of the Social Democratic Party, yesterday explained the terms upon which the Alliance would insist to keep either Conservatives or Labour in power in a Parliament without an overall majority.

Interviewed on London Weekend Television's Weekend World programme yesterday, Mr Jenkins said there was a "very wide gulf" between Labour policies and those of the Alliance.

He insisted that an agreed incomes policy would be essential if the Alliance was to keep Labour in power in that situation. He argued that expansion without the back-up of an incomes policy would lead to massive inflation.

Mr Jenkins made it plain that the Alliance would not support a Labour Government committed to withdrawing from Europe and pursuing a non-nuclear defence policy. He said that to withdraw from the EEC would be not only a financial disaster but also a "constitutional monstrosity" without a referendum.

In relation to the Conservatives, Mr Jenkins said the Alliance could not accept the present policy of planning to live with unemployment for the rest of this decade. The gap between the Alliance and the Conservatives would be irreconcilable unless Mrs Thatcher changed her policy on unemployment.



ITT would.

For some time, we've been concerned that scientists and engineers, the very lifeblood of a technology-based company like ITT, rarely seem to reach the very highest echelons of management.

Now we've actually done something about it. We've created a new position, ITT Executive Scientist.

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An ITT Executive Scientist can literally go anywhere in the world to explore an idea.

We'll give him the money he needs, the people he needs, the technology he needs.

Even if all he wants to do is put his feet up, all by himself, and think.

Naturally, we wouldn't make this kind of offer to any ordinary scientist.

But Charles Kao, the first ITT Executive Scientist, is far from ordinary. He's the man who brought fiber optics and laser electronics together, to create the concept that is revolutionising the world of telecommunications.

So we don't think we're exactly risking our shareholders' money by giving Dr. Kao such an open brief.

He'll have all the back-up he needs.

And he'll no doubt prove yet again that an original idea starts in an original mind.

The best ideas are the ideas that help people. ITT

BUILDING AND CIVIL ENGINEERING

ADVISING THE PARTIES

Industry policy package

THE Federation of Civil Engineering Contractors and the National Federation of Building Trades Employers have submitted a seven-point package of policy requirements to Conservative, Labour and Alliance candidates contesting the general election.

Conservatives are told not to relax on capital underspending. Government attempts to solve the problem of underspending by local authorities since last autumn are described by the builders as "too little and too late" — even though they acknowledge that public works construction orders since then have been coming out at the fastest rate for five years.

The former government party is also told that the industry wants better public investment management and more construction contracts.

Labour's proposed 50 per cent immediate rise in housing investment would "burst the balloon"; what the industry bodies ask for here is a steady commitment of increases averaging around 10 per cent in each of the next five years.

If Labour is proposing to remove the requirements on local authority direct works departments (DLOs) to obtain the majority of their work from the local authority on competitive tender, says another message, then this is a regressive step. The party is asked to abandon this threat.

It is also told that its proposals to "decasualise" a construction industry unique for its mobility is outdated and would undermine existing and successful employer-union negotiating machinery.

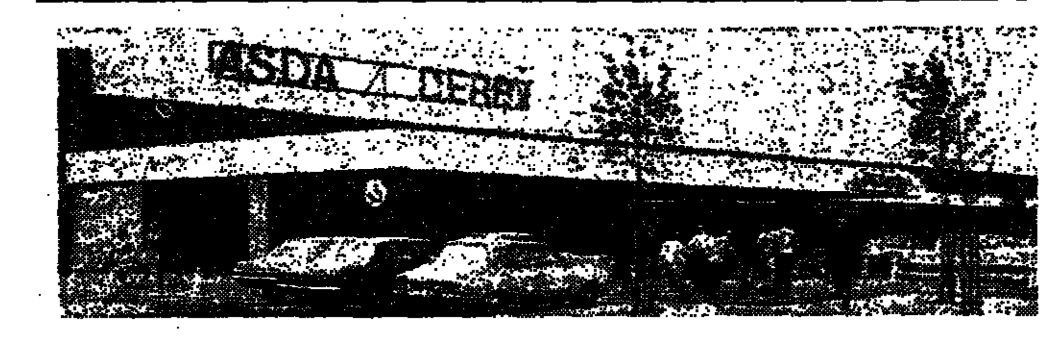
The Alliance is commended for its proposal to boost construction investment by £1bn in its first year of office and advised to increase it steadily over several years. However, it is noted that the Alliance has voted against certain of the competitive tendering provisions for DLOs; it is asked not to relax competitive tendering rules. WILLIAM COCHRANE

Support housing plea

SEVERE LOCAL housing difficulties could grow into an insoluble housing problem, claims the National Federation of Housing Associations in a policy statement calling on candidates in the General Election to support the growth of the housing association movement.

Speaking at the National Federation's annual meeting, Mr Richard Best, director, pleaded for "candidates to commit themselves to supporting measures which would increase our programme from 30,000 to 50,000 extra homes for rent each year."

He added that housing associations now provide homes for more than one million people. They have proved their ability to help solve Britain's housing crisis through their development work and high quality service of housing management and maintenance. J.E. C-S



Stores save heat cost

REDUCED ENERGY consumption has become a serious preoccupation with the engineers of ADG (Property Services), the store design and development arm of the Associated Dairies Group.

The group is now well ahead with a major building programme. Twelve Asda superstores (25,000 sq ft or over sales area) have recently been completed and five more are under construction. Asda, which used to be known as a Northern stores group, now has new premises from Halifax to Tilbury, and Norwich to Gloucester.

In all these stores ADG engineers have installed a heat reclaim system which was developed within the group. It uses waste heat extracted from the store's refrigeration system to provide a comfortable shopping and sales area.

Combined with efficient building insulation, by using the units the company says it is achieving savings of up to £14,000 a year on a typical store heating bill.

In adition, the system is considerably cheaper to buy and install than the previous method of indirect oil-fired roof-mounted air heaters, producing further savings of up to £40,000 per installation.

The Asda system uses well-proven commercial components supplied by the company's refrigeration and heating insulation contractors, who have been working on the new stores—R.E.A. Bott, W. H. O'Gorman, and Wanson.

According to Tom Garry, ADG's director of engineering services, "We believe that this development will play a major role in combating the problem of rising fuel costs in superstore operations. Our calculations have shown that it will be possible by using this system to save more than £500,000 a year on the heating bill of these new stores."

The new system was developed from previous installations in which the heat rejected from the refrigeration used for storing frozen and chilled foods, was partially reclaimed and used to heat the warehouse.

ADG engineers decided that there was no reason why one large condenser coil should not replace the units now installed on the roof and in the warehouse.

This unit could be installed within a centralised air handling plant providing the ventilation and heating for the store sales area and warehouse. The unit is mounted on the roof of the preparation area, next to the refrigeration compressor room.

The air handling unit, built by Wanson to ADG designs, introduces ducted air at high level in the store adjacent to the checkout area, so that the staff here receive the bulk of the heated air.

A portion of the air is taken to the warehouse at high level. Two fans, mounted in the compressor room, draw air from both the warehouse and the store. This is passed through the air handling unit picking up heat and a percentage of fresh air before returning to the sales area and warehouse. It can be modulated from full heating to full fresh air.

The unit includes a hot water generator, also using waste heat.

An indirect gas fired heater has been installed as a standby facility, but has proved to be hardly necessary.

ADG engineers hope that with the ever increasing need for refrigeration the system can be extended to provide heat for the offices as well.

TONY FRANCE

Sewer pipe in a gas main

A DRAMATIC first in sewerage construction is claimed by the Southern Water Authority for its installation of a 30 ins diameter sewerage pipe along the seafront at Hastings without digging a single trench. The scheme is remarkable because two miles of high density polyethylene pipe is being laid inside a disused gas main.

Sections of the plastic pipe are being welded together, then fed into the old iron gas main at a central point before being pulled through by a powerful winch.

As well as benefits to the town of Hastings and the local traffic, this method of construction has meant that the cost of the work has been reduced from £1.1m using conventional methods to a figure of £500,000, a saving of more than 50 per cent.

GERMAN CONSTRUCTION

Recovery too late for many

THE APPARENT recovery in Germany's construction sector has come too late for the 4,000-odd building firms which have gone out of business in the current slump. It is also threatening the existence of those contractors who successfully managed to weather it.

The key to this contrary situation lies both in the depth of the building recession over the last three years and in the nature of the uplift in domestic building activity so far this year.

When the recession struck in 1980 Germany's construction industry was already operating at some 30 per cent below capacity. It was also heavily dependent on public works, and public spending was one of the first sectors to be slashed. The results were traumatic.

In 1980, 1,041 building firms went out of business, in 1981, 1,515 and in 1982, 2,020. Last year the volume of orders for the major contractors was 25 per cent below that of 1979, employment of plant was at 55 per cent of 1979's level and labour employment in 1982 was 1.05m against nearly 1.3m in 1980. At the start of this year the total order book was an average 7 per cent down on the start of 1982, while public works orders were 17 per cent down.

To survive, contractors had to scramble for work, concluding fixed price contracts at prices which were frequently below current costs at a time when those costs were already rising by an average of 5 per cent a year. While that was a valid policy for weathering the recession, it could mean bankruptcy in a recovery.

Under normal circumstances increased demand for building would tend to push up both costs and prices. But the nature of the recovery in Germany so far makes it likely that costs will rise but that prices will stagnate or fall even further.

Although there appears to have been a dramatic increase in orders from the end of last year, these have been primarily in the housing sector, to the extent that it now makes up nearly 50 per cent of the total building volume. With the rise in activity, costs in building are rising and spilling over into the other construction sectors.

But only some 10 per cent of Germany's construction companies are involved in the housing sector. On the civil engineering side, contractors are now being subjected to costs pressure from the housing sector without feeling any benefit in increased demand for their services, leaving them in the same unhappy position of excess capacity and low prices.

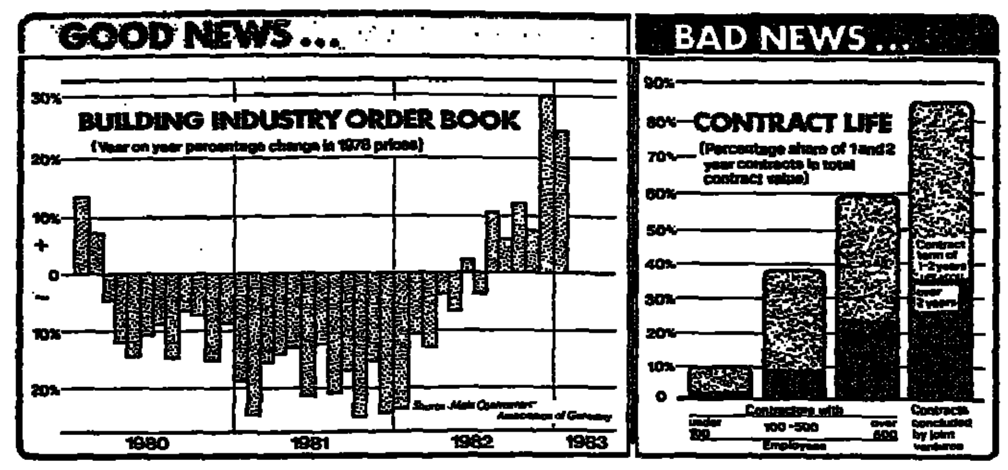
Nor is there much hope in prospect for those companies which depend on public spending for the larger part of their business. The local authorities in Germany, which award two-thirds of all publicly financed projects, forecast a 4-5 per cent fall in building financed by them this year. But even if public spending on construction was increased, its effects would be to add to the costs pressure on those contractors which concluded fixed price contracts last year.

Figures compiled by the Ifo Management Institute show that in 1979, 59 per cent of the contracts concluded by contractors with 500 or more employees had a term of over one year and 22 per cent a term of over two years. For contractors with 100-500 employees the shares were 37 and 7 per cent respectively.

On that basis, an average of 48 per cent of the below-cost, fixed price contracts concluded in 1982 will not be completed until 1985 and nearly 50 per cent will not be completed until 1984—both years in which costs are expected to rise rapidly if the recovery continues.

The position is even worse for contractors involved in joint contracts, with 85 per cent of orders having a term of over one year and 35 per cent a term of over two years. "It is difficult to see," says Dr Gunther Herion, president of the main contractors' association HVDB, "how these low price contracts can accommodate rising costs. Fixed price contracts concluded in 1982 could well end in bankruptcies in 1984 or 1985."

TOM SEALY



CONTRACTS

£15m work for Tarmac

Motorway works head a list of contracts, totalling £15m, awarded to TARMAC CONSTRUCTION. The motorway contract, worth about £8.1m, is for reconstructing the southbound carriageway of the M1 between junctions 15 and 16 in Northamptonshire for the County Council. At Luton, Tarmac has a £1.7m contract for a supermarket, plant room, three shop units and associated ancillary works for Sandfell. Other contracts awarded include: small industrial units at the University of Warwick, Coventry, for Barclays Bank (£960,000); an office and workshop at Longman Estate, Inverness, for Highland Regional Council (£330,000); and masons and paviors work for the City of London (£250,000). Cubitts, part of Tarmac Regional Construction, has a contract worth about £1.6m for refurbishing, repairing and cleaning a warehouse in Albert Dock, Liverpool, for Merseyside Development Council. Other Cubitts contracts include a Trustee Savings Bank at Liverpool (£212,000); extending a transport depot for Hamilton District Council, Strathclyde (£254,000); and a warehouse at Broxburn, Lothian, for Arthur Bell and Sons (£891,000).

*

In the first quarter of 1983 the WILLIAM STEWARD GROUP has received orders for UK electrical/mechanical contracting and manufacturing divisions of £8.4m. Largest is at R. S. Components, Corby, worth over £1m.

*

Leeds-based MANSTON (CONTRACTORS), part of the construction division of the Espley-Tyas property group, has won two superstore contracts totalling £4m. The first is to build an 88,000 sq ft superstore complex at Wakefield for Asda Stores, and at Heywood in Lancashire. Manston has begun work on another superstore, this time of 50,000 sq ft, for Wm Morrison Supermarkets.

WEEK'S FINANCIAL DIARY

The following is a record of the principal business and financial engagements during the week. The board meetings are mainly for the purpose of considering dividends and official indications are not always available whether dividends concerned are interims or finals. The sub-divisions shown below are based mainly on last year's timetable.

TODAY

COMPANY MEETINGS—
Arrow Chemicals Hldgs. Newton Park Hotel, Newton Solney, Nr Burton-on Trent, 12.00
Comoen Group, Dragonara Hotel, Redcliffe Way, Bristol, 12.30
Fisher (James) & Sons, Lisdoonie Hotel, Abbey Road, Barrow-in-Furness, 12.00
Fitch & Co. Design Consultants, County Bank Limited, 11, Old Broad Street, EC, 12.00
Garfunkels Restaurants, Capel Cure Myers Ltd, Bath House, Holborn Viaduct, EC, 10.00
Jackson Exploration Inc, Merchant Taylors' Hall, Threadneedle Street, EC, 11.30
Ocean Transport & Trading, India Buildings, Liverpool, 2.30
Wiggins Teape (UK), Gateway House, Basing View, Basingstoke, Hants, 12.45

BOARD MEETINGS—
Finals:
Assd British Foods
Cakebread Robey
Gates (Frank G.)
Southwest Resources
Toshiba
Interims:
ANZ Bank
Concentric
Cosalt
Pyke

DIVIDEND & INTEREST PAYMENTS—
B.B.L. Intnl NV Fltg Rate Nts 1986 $267
Banco De La Prov De Buenos Aires Fltg Rate Nts 1988 $267
Britannia Arrow Hldgs 0.9p
Friedland Doggart Group 3.51p
Kalamazoo 0.83p
Land Investors 0.2p
Mills and Allen Intnl 4p
Nationwide Building Society 13¾pcBds 23/5/83 £7.1656
Pressac Hldgs 0.35p
SeaCo Inc 10.5 cts
Sharna Ware 1.3301p
Slough Estates 2.075p
Tolux S.A. 27 cts
Treasury 13¼pcLn 1993 6⅝pc

TOMORROW

COMPANY MEETINGS—
A.P.V. Hldgs, Institute of Directors, 116, Pall Mall, S.W., 12.00
Air Call, 176-184, Vauxhall Bridge Road, S.W., 11.00
Assoc Book Publishers, 11, New Fetter Lane, E.C., 12.00
Bank of Scotland, The Mound, Edinburgh, 12.15
Bemrose Corp, Great Eastern Hotel, Liverpool Street, E.C., 11.45
Elys (Wimbledon), 22-26, Wimbledon Hill Road, Wimbledon, 6.00
Invergordon Distillers (Hldgs), Merchants' House of Glasgow, 7, West George Street, Glasgow, 12.30
Nichols (J. N.) (Vimto), Ledson Road, Wythenshawe, Manchester, 11.00

BOARD MEETINGS—
Finals:
Lanca
Nthn American Tst
Parkland Textile
Sainsbury (J.)
TR Property Inv Tst
Interims:
Archimedes Inv Tst
Hardanger Props
ICL
Ranks Hovis McDougall
Scottish Natl Tst
Stakis

DIVIDEND & INTEREST PAYMENTS—
Astbury and Madely (Hldgs) 3.75p
Fisher (James) and Sons 1.5p
Insurance Corp of Ireland 8.135p
Do A 8.135p
Kleinwort, Benson, Lonsdale 8p
Midland Intern Fin Serv BV Gtd Fltg Rate Nts 1987 $51.22
Royal Bank of Canada 50 cts
Security Pacific Overseas Fin BV Gtd Fltg Rate Nts 1891 $505.92
Shell Transport and Trading Co (Reg) 12.6p
Do (Br) 12.6p
Smith and Nephew Assoc Cos 2.8p
Stag Furniture Hldgs 3.25p
Tesoro Petroleum Corp 10 cts
Treasury Var Rate 1983 £5.23

WEDNESDAY MAY 25

COMPANY MEETINGS—
BAT Inds, St John's, Smith Square, Westminster, SW, 11.30
Biddle Hldgs, Cafe Royal, Regent Street, W, 12.00
Booker McConnell, London Chamber of Commerce and Industry, 69, Cannon Street, E.C., 12.00
Charterhouse Petroleum, Ironmongers' Hall, Barbican, E.C., 11.30
Clyde Petroleum, Central Hotel, Gordon Street, Glasgow, 12.00
Croda Intnl, Croda Colloids, New Bedford Road, Luton, Bedfordshire, 12.00
Fogarty, Havenside, Fishtoft Road, Boston, Lincs, 2.15
Guardian Royal Exchange Assc, Chartered Insurance Institute, 20, Aldermanbury, EC, 12.00
House Property Co of London, Eagle House, High Street Wimbledon, S.W., 12.00
Jacks (William), Pennyhill Park, Bagshot, Surrey, 11.30
Jenners, Princes Street, Edinburgh, 11.00
Miller (Stanley) Hldgs, Brandling House, Gosforth Park Racecourse, Newcastle upon Tyne, 12.00
Northern Eng Inds, Gosforth Park Hotel, Newcastle Upon Tyne, 12.00
Phicom, Centre Point, 103, New Oxford Street, W.C., 12.00
Phoenix Assoc, Phoenix House, 4-5, King William Street, E.C., 12.00
Rockware Group, Great Eastern Hotel, Liverpool Street, E.C., 3.00
Rotork, Rotork House, Brassmill Lane, Bath, 3.00
Southampton, IOW and SOE RM Steam Packet, Post House Hotel, Herbert Walker Avenue, Southampton, 12.30
Sun Life Assc Soc, 107, Cheapside, EC, 12.30
Weir Grp, Merchants' Hall, 30, George Square, Glasgow, 12.00

BOARD MEETINGS—
Finals:
Allied Irish Banks
Boots
Capital and Counties
Channel Tunnel Invs
Foster Bros
Jantar
London and Northern
M and G Second Dual Tst
Merrydown Wine
Minster Assets
Monks Inv Tst
Morland
Sandhurst Marketing
Wettern Bros
Interims:
Avon Rubber
Bass
Devenish (J. A.)
Gen Stockholders Inv Tst
Intnl Thomson
Kelsey Inds

DIVIDEND & INTEREST PAYMENTS—
A.P.V. Hldgs 7.7p
Aluminium Company of America 30 cts
Assoc Book Publishers 4.5p
Baker Intnl Corp 23 cts
Broken Hill Proprietary Co 21 cts
Eaton Corp 20 cts
House Property Co of London 4.5p
Merrill Lynch and Co Inc 40 cts
Miller (Stanley) Hldgs 1p
Newmarket Company (1981) 14 cts
Southampton, IOW and SOE RM Steam Packet 6.5p
TSW-Television South West Hldgs 0.3p
TSW TV South West Hldgs 0.3p
Ultramar 9.5p

THURSDAY MAY 26

COMPANY MEETINGS—
Aero Needles Group, Clive Works, Redditch, 3.00
Beaufort Group, George Hotel Huddersfield, 12.00
Bellair Cosmetics, New Road, Winsford, Cheshire, 12.00
Blackwood Hodge, Dorchester Hotel, Park Lane, W., 11.00
British Printing Cpn, 74, Worship Street, EC, 12.00
Carlton Inds, Dragonara Hotel, Redcliffe Way Bristol, 12.30
Clayton, Son and Co (Hldgs), Queen's Hotel, Leeds, 2.00
Estates and Gen Invs, Claridges, Brook Street, W, 5.30
Feb Intnl, Albany House, Swinton Hall Road, Swinton, Manchester, 11.30
Forward Tech Inds, Ironmongers' Hall, Shaftesbury Place, Barbican E.C., 12.00
Freemans, Tallow Chandlers' Hall, 4, Dargate Hill, E.C., 12.00
General Investors and Trustees, 1, Laurence Pountney Hill, E.C., 12.00
Glynwed Intnl, Headland House, Sheldon Birmingham, 12.00
Greenbank Ind Hldgs, Orient Works, Gate Street, Blackburn, Lancashire, 3.00
Harris Queensway, Harris House, 76, High Street, Orpington, Kent, 11.00
Henriques (Arthur), Midland Hotel, Manchester, 12.00
Jacobs (John I.), Baltic Exchange, 14-20, St Mary Axe, E.C., 12.00
Jerome (S.) and Sons (Hldgs), Post House Hotel, Bramhope, 12.30
Lawrence (Walter), Lawrence Social Hall, Sheering Mill Lane, Sawbridgeworth, Hertfordshire, 12.00
London Utd Invs, Merchant Taylors Hall, 30 Threadneedle Street, E.C., 12.00
Magnolia Group (Mouldings), Sutton Road, Rochford, Essex, 12.00
Marlborough Property Hldgs, Howard Hotel, Temple Place, W.C., 11.30
Marshall (Thomas), Royal Victoria Hotel, Sheffield, 12.00
New London Properties Hilton Hotel, Park Lane, W., 12.30
Newarthill, Royal National Hotel, Bedford Way, Russell Square, W.C., 12.30
Portals Hldgs, Howard Hotel, Temple Place, Strand, W.C., 12.30
Prudential Corp, 142, Holborn Bars, E.C., 12.15
Solicitors Law Stationery Society, Hill House, 1, Little New Street, E.C., 12.00
Wills (George and Sons (Hldgs) Armoury House, City Road, E.C., 11.15
Wood (Arthur) and Son (Longport), Bradwell Works, Longport, Stoke-on-Trent, 12.00
York Mount Group, Dudley House, Upper Albion Street, Leeds, 11.45

BOARD MEETINGS—
Finals:
Allied Leather
Deritend Stamping
Fidelity Radio
Fine Art Devs
Hill (Philip) Inv Tst
London Sumatra Plantations
Modern Engineers of Bristol
Moss Bros
Plessey
Portsmouth and Sunderland Newspapers
Young and Co's Brewery
Interims:
Brockhouse
Greenall Whitley
M and G
RHP
Richards
Scottish Inv Trust
Scottish Clark Metal Inds
Stockholders Inv Tst

DIVIDEND & INTEREST PAYMENTS—
Beaufort Group 2.1p
Bemrose Corp 6p
Bibby (J.) and Sons 5.15p
Christies Intnl 5p
Clayton Son and Co (Hldgs) 8.0683p
Clyde Petroleum 0.605p
Drayton Consolidated Trust 2p
Elys (Wimbledon) 6p
Feb Intnl 1.65p
Do A NV 1.65p
Fogarty 2.42p
Minerals and Resources Corp 9.25pc Cnv Sub Bds 1997 4⅝pc
Prudential Corp 10p
Queens Moat Houses 0.605p
Southend-on-Sea Borough Council 12pc Red 1987 6pc
Trans-Oceanic Tst 0.84p
Wood (Arthur) and Son (Longport) 0.5p

FRIDAY MAY 27

COMPANY MEETINGS—
Babcock Intnl, Business Centre, Institute of Directors, 116, Pall Mall, S.W., 12.30
Benford Concrete Machinery, The Cape, Warwick, 12.00
Black (A. and C.), 35 Bedford Row, W.C., 12.00
Bodycote Intnl, St James's Club, St James's House, 7, Charlotte Street, Manchester, 12.30
Boot (Henry) and Sons, Banner Cross Hall, Sheffield 12.00
Bowater Corp, CBI Conference Centre, Centre Point, 103, New Oxford Street, W.C., 11.00
Breedon and Cloud Hill Lime Works, Breedon-on-the-Hill, Leicestershire, 11.00
Charterhouse Group Plaisterers Hall, 1, London Wall, E.C., 12.00
Elbar Ind, Chartered Insurance Institute, 20, Aldermanbury, E.C., 10.30
Firmin and Sons, Lambert Court Hotel, 334, Hagley Road Edgbaston, Birmingham, 12.15
Fothergill and Harvey, Midland Hotel, Peter Street, Manchester, 12.30
Menzies (John), Merchants' Hall, 22, Hanover Street, Edinburgh 12.15
Minet Hldgs, Tower Hotel, St Katherines Way, E., 12.00
Nash (William), Cray Valley Paper Mills, St Paul's Cray, Kent, 2.30
Ottoman Bank, Baltic Exchange 14-20, St Mary Axe, E.C., 11.00
Pearson (S.) and Son, Millbank Tower, Millbank, S.W., 12.00
Photax (London), Brampton Road, Hampden Park, Eastbourne 12.00
RMC Group, Carlton Tower Hotel, Cadogan Place, S.W., 11.30
Relyon Group, Beam Bridge Hotel, Sampford Arundel, Wellington, Somerset, 12.00
Sparrow (G. W.) and Sons Beau Nash Rooms, Lansdown Grove Hotel, Bath, 12.00
Spencer (George), Wimbourne House, Bar Lane, Basford, Nottingham, 12.00
Steel Bros Hldgs, Sondes Place, Westcott Road Dorking, Surrey, 12.00
Trafalgar Grp, 10, Stratton Street, W, 12.50
Toye and Co, Connaught Rooms, 15, Great Queen Street, W.C., 11.00
Triplevest, 117, Old Broad Street, E.C., 2.30
Wadkin, Green Lane Works Leicester, 3.00
Websters Group, Bishopsgate Institute, 230, Bishopsgate, E.C., 12.00
Wilson (Connolly) Hldgs, Saxon Inn, Northampton, 12.00

BOARD MEETINGS—
Finals:
Hicking Pentecost
Macdonald Martin Dists
Nineteen Twenty-Eight Inv Tst
Interims:
Gomme
Leech (William)
Moran Tea
North British Steel
Pict Petroleum

DIVIDEND & INTEREST PAYMENTS—
Air Call 3.75p
Alva Inv Tst 3.6p
Bank of Montreal 14½pc Dep Nts 27/5/87 7¼pc
Barratt Developments 4.2p
Benford Concrete Machinery 2.605p
Boot (Henry and Sons) 11.5p
Bramell (C. D.) 3.95p
British Mohair Spinners 3.24p
Bryant Hldgs 0.55p
Cape Inds 3.9p
Carlton Inds 2p
Camden Group 1.35p
Electro-Protective Corp of America 1 ct
Expamet Intnl 2.5p
Firmin and Sons 2.5p
Fothergill and Harvey 3.25p
Garfunkels Restaurants 1p
General Investors and Trustees 2.4p
Henriques (Arthur) 1p
Highland and Lowlands Berhad 10Sen
Home Charm 3.15p
IMI 2p
Jacobs (John I.) 1.9p
Jerome (S.) and Sons (Hldgs) 1.995p
Jersey Electricity Co A 11p
Jove Inv Tst 2.30p
Kent (M. P.) 0.36p
Magnolia Group (Mouldings) 1.7p
Marlborough Property Hldgs 0.45p
Molins 5.7p
Morrison (Wm.) Supermarkets 1.15p
New Tokyo Inv Tst 0.035p
Peachey Property Corp 2.25p
Rotork 2.15p
Sharpe and Fisher 1.45p
Sime Darby Berhad 4Sen
Sunbeam Wolsey 3p
Do. 8pc Pref 3.012p
Turner and Newall 11½pc Mtg Deb 1995-2000 5.875p
United Ceramic Distributors 2.5p
Weir Group 1.75p

SATURDAY MAY 28

DIVIDEND & INTEREST PAYMENTS—
Burndene Invs 8½pcLn 1980-85 4¼pc
Charterhouse Group 3.25p

Wolsingham Steel managers in rescue bid

BY NICK GARNETT, NORTHERN CORRESPONDENT

THE MANAGEMENT at Wolsingham Steel, Durham, the British Shipbuilders subsidiary steel works which the state corporation is closing, is trying to buy the buildings and equipment and to maintain steelmaking there.

Two local authorities — Durham county council and Wear Valley district council—announced yesterday that they would jointly provide a £250,000 loan guarantee to support setting up a manufacturing company at the site, where employment has fallen from 400 to 120 in the past five years.

The site produces steel from scrap, produces stand frames and rudders, and makes the steel castings and steel-plate application for those purposes. Only a third of its output has traditionally gone to British Shipbuilders.

Mr John Mason, the plant's local manager, has been in discussion with several banking and financial institutions. These, however, have all been seeking a form of financial commitment from someone else before committing funds.

The management has already formed a company, Weardale Steel (Wolsingham), which is taking orders for new work. It cannot carry out the work unless the Wolsingham assets are purchased. Mr Mason made clear yesterday that the present company would have to close before that could be done.

Wolsingham Steel made a loss of about £900,000 in the past financial year, though some of this is attributed to British Shipbuilders having halted intake of new orders.

BUSINESSMAN'S DIARY

UK TRADE FAIRS AND EXHIBITIONS

May 24-27
Chelsea Flower Show (01-834 43333) **Royal Hospital**

May 24-26
International Conference and Exhibition on Computers and Communications in Investment Banking and Insurance (Northwood Hills (09274) 28211) **Barbican**

May 24-27
International Word and Information Processing Exhibition and Conference (01-405 6233) **Wembley Conference Centre**

June 1
Advertising Business Systems Show (01-637 7438) **Press Centre, EC4**

June 3-11
Fine Art and Antiques Fair (01-385 1200) **Olympia**

June 5-7
Offshore Computers Conference and Exhibition (01-734 4343) **Aberdeen**

June 8-10
Chemical and Processing Engineering Show—EUROCHEM (01-747 3131) **NEC Birmingham**

June 12-16
Shopex International (01-540 1101) **Olympia**

June 28-30
Printing, Packing and Allied Trades Exhibition (Norwich (0603) 715588) **East Anglia Exhibition Centre**

June 28-July 1
Security Tradex '83 (Redhill (0737) 68611) **NEC Birmingham**

June 28-July 1
ROSPA International Safety Exhibition (Birmingham (021) 780 4141) **NEC Birmingham**

July 4-7
Royal Agricultural Show (0203 555100) **National Agricultural Centre, Kenilworth**

July 5-7
The Leeds Electronics Show (Saffron Walden (0799) 22612) **University of Leeds**

July 6-8
Micro Trade Exhibition (01-486 1951) **Barbican**

OVERSEAS TRADE FAIRS AND EXHIBITIONS

Current
Algiers International Trade Fair (01-221 7800) (until June 1) **Algiers**

May 24-27
International Trade Fair for Industrial Cleaning and Maintenance (020 5411411) **Amsterdam**

May 27-June 5
Paris Air Show (720.61.09) **Paris**

June 8-10
International Telecommunications Congress and Trade Fair —IFCOM (01-930 7251) **Cologne**

June 9-12
International Saw Mill Machinery and Forestry Exhibition—ELMIA (0732 850 457) **Jonkoping**

June 19-22
Latin American Petroleum Show (01-546 5144) **Venezuela**

June 21-24
EUROPIPE '83 and EUROTUNNEL '83 (0727 63213) **Basle**

June 22-24
Under Water Technology '83 (01-250 3561) **Amsterdam**

June 26-29
National Fancy Food and Confection Show (0483 38085) **Washington**

June 27-July 1
Manufacturing and Plant Maintenance Exhibition — PEMEX (01-486 1951) **Johannesburg**

BUSINESS AND MANAGEMENT CONFERENCES

May 24
Chatham House: Hawke's Australia, chances of economic recovery (01-930 2233) **St James's Square, SW1**

May 24
Industrial Society: Quality circles —keeping the enthusiasm going (01-839 4300) **Carlton House Terrace, SW1**

May 24-25
British Franchise Association: Expansion through franchising (Colnbrook (964) 4909) **Holiday Inn, Swiss Cottage**

May 24-26
Institution of Civil Engineers: 7th World Airports Conference (01-222 7722) **Café Royal, W1**

May 25
IWP: Teletext and the word processor user (01-242 8697) **Wembley Conference Centre**

May 26-27
Afinnovac: Venture Capital in the European/French context (Paris (1) 622 2445) **Fontainebleu**

June 1
Brighton Polytechnic: Interactive video and computer training (Eastbourne (0323) 21400) **Eastbourne**

June 1-2
FT Conference: Vehicle components (01-621 1355) **Geneva**

June 2
Institute of Directors: City branch annual conference (01-606 7700) **Press Centre, EC4**

June 6-7
The Economist: Western arms co-operation—how to make joint procurement work **Portman Square, W1**

June 6-10
Management Centre Europe: International negotiations (219.03.90) **Brussels**

June 8-9
Manchester Business School: Strategies: to reduce unemployment (061-273 8228) **Manchester**

June 9-10
Computer Assisted Televideo: Interactive videodisc seminars (01-588 1932) **Kensington Close Hotel, London**

June 9-10
Frost and Sullivan: Systems network architecture (01-486 0334) **Cumberland Hotel, London**

June 14
CBI: The A to Z of employment law (01-379 7400) **Centre Point, WC1**

June 16
IPS: The world truck (0780 56777) **Tara Hotel, W8**

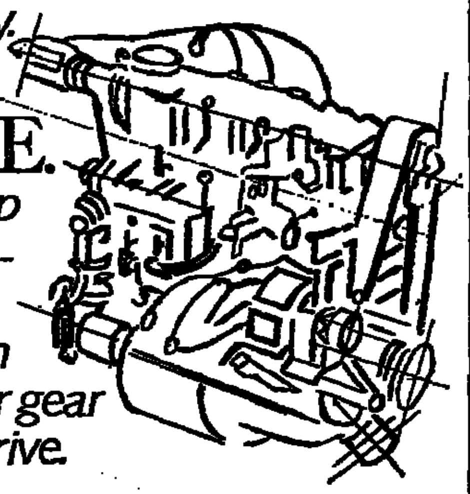
June 16
Dun and Bradstreet: Effective collection techniques (01-247 4377) **Holiday Inn, Birmingham**

June 16
Institute of Directors: Performance related pay systems (01-839 1233) **Pall Mall, SW1**

Anyone wishing to attend any of the above events is advised to telephone the organisers to ensure that there has been no change in the details published

Meet the Nova. Vauxhall's new little car. A car designed to do a lot, a little better.

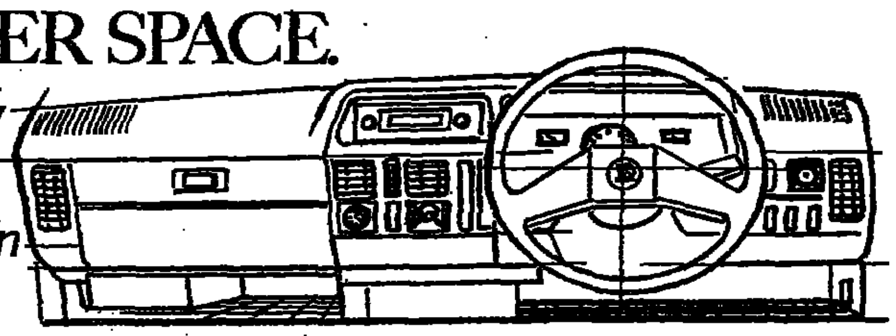
Its imaginative design has achieved a greater sense of space in a quieter interior. And a new generation of engines offer more power, more punch and more economy.



BETTER TO DRIVE.

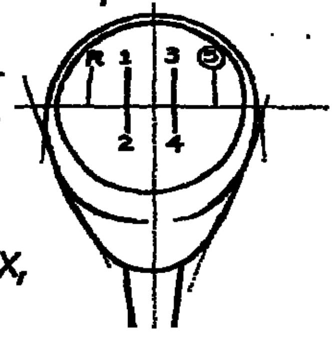
Even in third gear, the Nova will zip from 15mph to 65mph and back again without the slightest hesitation from the engine. An achievement made possible by the design concept of Low End Torque (LET). With fewer gear changes, the Nova's easier and punchier to drive.

BETTER SPACE.



Within modest inches, the Nova is deceptively large. Its wide doors open wider than its major competitors. Likewise, it offers the driver better headroom, better legroom and better hiproom.

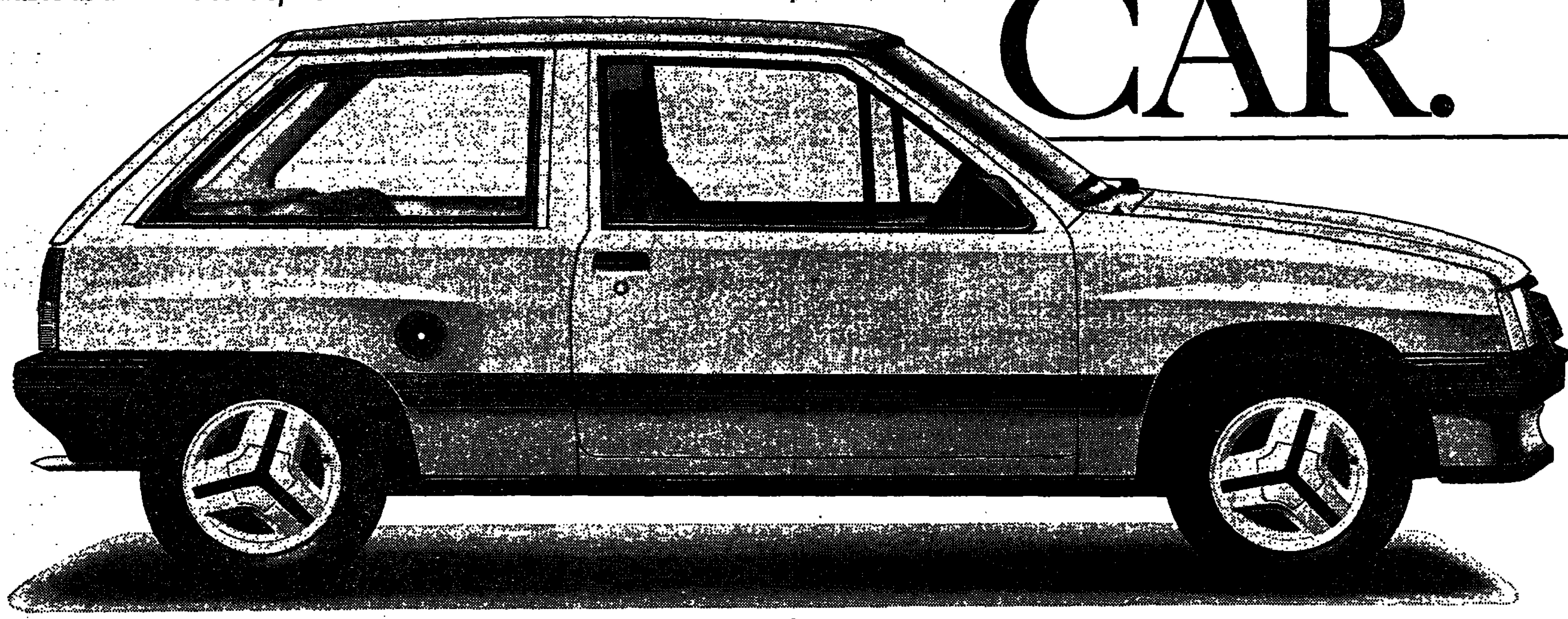
BETTER ECONOMY.



With the aid of better aerodynamics, the Nova's 1.0 and 1.2 litre LET engines deliver 57.6 mpg at 56mph. And 60.1 mpg with the 5-speed gearbox, available as an extra cost option.

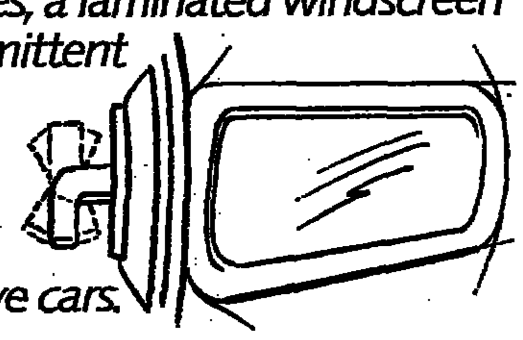
THE NEW VAUXHALL NOVA.

THE LITTLE BETTER CAR.



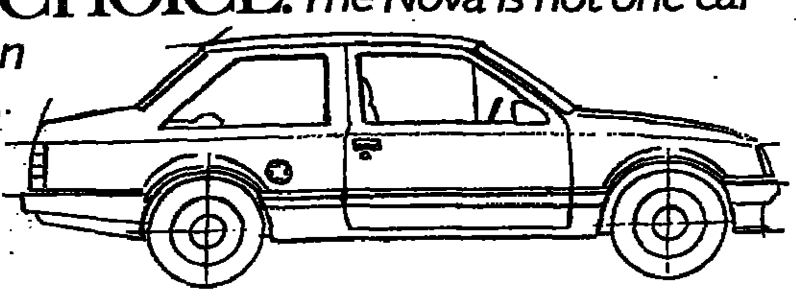
BETTER EQUIPMENT.

In striking contrast to other small cars, the Nova features a fully integrated dashboard. Every model has power brakes, a laminated windscreen and halogen headlamps. There's an intermittent rear wash wipe on hatchbacks. And on L models, there's a push button radio and a drivers door mirror that adjusts from inside the car. All touches of luxury traditionally found only on more expensive cars.



BETTER CHOICE.

The Nova is not one car but two. The saloon offers an enormous boot of 15.2 cu.ft. which is even bigger than you'll find on a lot of much larger family saloons.



FROM £3,496.

Until now a modest price meant a basic car. Nova marks the turning point. We offer all of its refinement in 4 models, from just £3,496 to £4,273. The Nova is waiting for you to test drive at your friendly Vauxhall-Opel dealer.

NOVA

BETTER. BY DESIGN.

VAUXHALL GM OPEL

BACKED BY THE WORLDWIDE RESOURCES OF GENERAL MOTORS

ILLUSTRATED: NOVA L HATCHBACK £4273. DASHBOARD FROM NOVA L. ALLOY WHEELS SHOWN ARE AN EXTRA COST OPTION. ALL PRICES, CORRECT AT TIME OF GOING TO PRESS, INCLUDE CAR TAX AND VAT. DELIVERY AND NUMBER PLATES EXTRA. DOT FUEL CONSUMPTION FIGURES MPG (L/100KM). NOVA 1.0: CONSTANT 56 MPH: 57.6(4.9); CONSTANT 75MPH 42.8(6.6); URBAN CYCLE: 37.7(7.5). NOVA 1.2: CONSTANT 56 MPH: 57.6(4.9); CONSTANT 75 MPH: 43.6(6.5); URBAN CYCLE: 34.0(8.3). NOVA 1.0 5 SPEED: CONSTANT 56 MPH: 60.1(4.7); CONSTANT 75 MPH: 44.0(6.4); URBAN CYCLE: 37.1(7.6). NOVA 1.2 5 SPEED: CONSTANT 56 MPH: 60.1(4.7); CONSTANT 75 MPH: 44.8(6.3); URBAN CYCLE: 33.2(8.5).

TECHNOLOGY

EDITED BY ALAN CANE

MASS TRANSIT SYSTEM AT A FRACTION OF PRESENT COSTS

Flyda seeks slice of the cake

BY ELAINE WILLIAMS

FRANCIS PERROTT is an ex-naval officer and engineer who decided that he could design urban mass transit systems for the fraction of a cost of traditional transport.

So he set up a company called Flyda to put his theories into practice. Partly funded by himself and Electra Risk Capital, the company hopes to eventually take a large slice of the mass transit market which is currently worth around U.S.$7bn a year.

The Flyda system consists of lightweight, quiet, rubber-tyred vehicles powered by electric motors capable of carrying 12 passengers each. These are cantilevered from overhead guideways. Narrow elevated steel or concrete bridge structures will support the elevated tracks which are only 1.5 metres to 2 metres wide.

Elevated

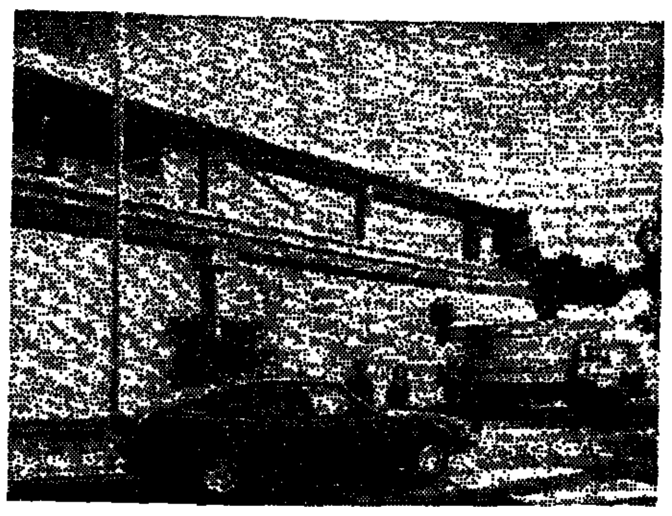
The light bridging span of the elevated track has slim 70 cm diameter supports spaced between 12 and 30 metres. The company says that other transit systems need large constructions up to 8 metres wide for their elevated runways.

Trains can be cantilevered from either side of the guideway. A simple roof mounted "switch wheel" allows trains to select tracks on elevated guideways or on the ground so that no moving parts are needed on the track itself.

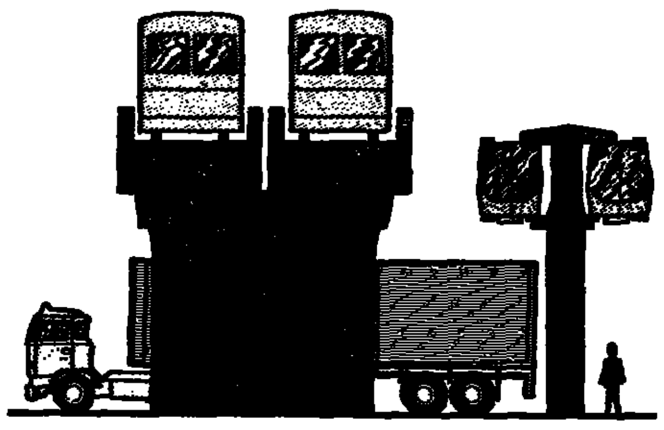
Such a system, says Mr John Emanuel, Flyda's marketing director, would cost around 40 per cent of a comparable elevated system and a mere 10 per cent of the cost to build an underground railway system. Depending on the capacity and situation of the mass transit system the cost for a Flyda network would average out between U.S.$3m and U.S.$12m per km of track. Even so, Mr Emanuel says that the system would be capable of handling the traffic capacity of the London underground, for example.

Basic

Typical costs for a conventional elevated system costs between U.S.$25m to U.S.$60m per km while underground construction costs U.S.$50m to U.S.$120m per km, says Mr Emanuel. A basic ground transportation is the cheapest of all costing between U.S.$1m and U.S.$5m.



Above. The Flydaway Pre-cast Concrete Track with Flyda-craft. Below: A comparison between conventional elevated light rail (left) and a "Flydaway."



Flyda has estimated that its system could run economically with a train interval of about one minute. With trains made up of vehicles carrying between 12 and 20 passengers, it is possible to adjust train lengths according to time of day. Since they are computer controlled, it will be possible to operate an off-peak passenger demand service.

A prototype system is now being constructed which should be ready for demonstration in September. The first passenger vehicle is being built by International Automotive Developments, IAD, specialists in prototype vehicle building, based at Worthing. This will be tested on a 250 metre indoor track now being constructed in Kidderminster by crane-makers Fellows Stringer. By next year this will be extended to an outdoor track of about 600 metres.

In advance of the prototype, Flyda has tenders for two UK projects with GKN Contractors. It also hopes to seek similar co-operative arrangements with overseas contractors for future major urban transit systems.

Manchester University is developing the control system for Flyda. Each of the 12-seater passenger vehicles will contain at least two microprocessors which will control the vehicle routing and communications with the central routing computer based at a main station.

Mr Emanuel said that the company hopes that a car manufacturer would take over the manufacture of the passenger vehicles once mass production orders had been received. Reliant has already shown interest in being involved with the Flyda in this respect. The company is very confident that it has a place in the mass transport business.

Several transport authorities in North America, Europe and Asia have expressed interest in Flyda's concept and are now awaiting the operation of the prototype system before any firm commitments are made said Mr Emanuel.

The company has also started bidding for contracts in the UK. It hopes to bid for the London Docklands light rail transit system in partnership with a major civil engineering company. Flyda reckons that it could cut as much as £30m off the budgeted cost of £65m to build it.

At present Flyda has to prove that it can provide an efficient, safe and low-cast mass transit system which has a minimal effect of the environment as Mr Perrott claims. If the company does get off the ground, in every sense of the word, it could create opportunities for up to 20,000 jobs in the UK with an output of about 20,000 vehicles a year by the end of the decade.

Banking

Transfer service

BANKERS' AUTOMATED Clearing Services (BACS) the UK banks electronic funds transfer service will now allow corporate customers to transfer debit or credit instructions over the telephone, thus saving the transport costs of moving magnetic tapes or discs to the BACS computer centres.

Companies will be able to transmit instruction either at prearranged times or at will throughout the day.

The new system, BACSTEL, will cost no more than any other form of electronic funds transfer and reporting back to confirm instructions is instantaneous, Mr Derek Balmforth of BACS Marketing Department claims. BACS is on 01-626 8486.

AMBITIOUS SOFTWARE SUPPORT COMPANY

£400,000 venture capital for Sphinx

BY TIM DICKSON

AN AMBITIOUS new software support company—headed by former Zilog European marketing manager, Pamela Geisler, has just been launched with £400,000 of venture capital backing.

The aim of Sphinx—as the new business is called—will be to market and support software based on the Unix operating system and, once this is established, move into promoting "turnkey" systems.

Money for what is a substantial start up by any standards is being put up by two venture capital specialists—the APA Venture Capital Fund and Abingworth, a company which is planning an Unlisted Securities Market listing.

Tempted

Each is contributing £200,000, but in line with what APA claims is now common practice in the U.S. the share of the equity which they have bought is not at this stage being disclosed. The management team, which includes another ex-Zilog executive, holds a controlling interest.

Geisler has been tempted into setting up on her own by the high degree of interest in Unix, a microcomputer language the appeal of which lies in its multi-user facilities, its portability across machines from different manufacturers and the wealth of system development aids.

IBM and the Digital Equipment Company (DEC) (Unix was developer in Bell Labs on its PDP 11mini computer), have both recently announced that it will be available shortly on their machines.

While many academics beg to differ, there is a widespread feeling, shared by the founders of Sphinx, that Unix will inevitably become the standard operating system for 16 and 32 bit microcomputers.

"Unix operating systems are being adapted by the majority of manufacturers," says Dr Doug Eyeions, director general of the Computing Services Association. "When IBM and DEC move the world is likely to follow.

"There is certainly a shortage of companies concentrating just on Unix software. I would say that Sphinx is on a good wicket."

Initially, the new company will distribute tools and applications software to run on Unix machines. Sphinx will not develop software, rather it will publish, package, actively market and support software sourced in the UK and the U.S.

Besides expressing confidence in the future of Unix, Geisler feels Sphinx represents the first centralised supply resource for the system in the UK. Target customers will be OEMs, distributors, large end users and other software houses.

Leading manufacturers or agents of Unix-based microcomputers include Plexus, Wicat, Altos, Tandy and Fortune and Bleasdale. Sphinx has contacts, meanwhile, with Keen Computers, Thame Systems and Encotel Systems which are the leading distributors of Unix machines and systems in the UK.

"The first aim will be to gather up the best software products and sell them; then we will find ones which need a certain amount of co-operative effort and offer a marketing service; and finally, we will directly commission products for which we feel there is strong potential," says Geisler.

APA has clearly been impressed by Geisler's knowledge of the hardware market, her contacts in the industry and her appreciation of end users' software requirements. But in turn APA's Peter Englander has contributed more than just money — having sounded out industry experts on the likely markets for the new service and helped build the management team in advance of the launch.

The APA Venture Capital Fund which has now committed more than £3m of its £10m total resources had already invested in computers but also takes equity stakes in non-technology companies.

Investments include Encotel Systems, Systematics (the microcomputer software company) and My Kinda Town, the company which owns the Chicago Pizza Pie Factory.

Mr Peter Englander, APA, Dr Pamela Geisler of Sphinx and Mr Ronald Cohen, Managing Director of APA, signing the documents for the launch of Sphinx.

Competition

Engineers' design contest

THREE of Britain's top engineering people are to judge a nationwide engineering design competition — the Archimedes Awards — for which entries are now being sought.

They are Sir Monty Finniston, former chairman of British Steel and author of the Finniston Report on the engineering profession; Clive Sinclair, chairman of Sinclair Research and the man behind the world's fastest selling line of home computers; and E. A. L. Hyde, the recently retired Director of Research, British Aerospace Corporation, and now a consultant.

Exploits

British manufacturing companies are invited to submit entries in three categories chosen to reflect current challenges in engineering design. These are: the best technical innovation in a new or redesigned product; the most innovative advance in product design made possible by incorporating electronic control; and the finest example of a product which exploits a new manufacturing technique or process.

The judges will select three finalists in each category with the eventual winners being chosen by a postal ballot among the readers of Eureka, the engineering design journal. The awards will be presented at a dinner in Birmingham on October 4, the opening day of the Design Engineering Show at the NEC.

For entry details contact Eureka on 0322 77755.

Printing

Bottle specialists

SCREENLINE, a relatively new London company that specialises in printing on bottles and containers has had its first export orders from India and Pakistan for a recently introduced machine that can handle a wide range of items at high speed.

Designated 455/GB/3, the machine can handle diameters between 35 and 100 mm and heights from 100 to 300 mm. The throughput varies from 20 to 80 bottles per minute.

Employing three screen printing heads that can deal with body and shoulder of the bottle in one pass, the machine is completely integrated mechanically and is driven by one variable speed motor.

After installation, no timing adjustments are needed, whatever speed or bottle size is selected, and the machine is able to operate on a three shift basis. More on 01-741 0441.

Cameras

Graphics

A MICROCOMPUTER controlled camera for use in the print and graphics industry has been launched by Halco Sunbury, the UK based company. The company has been working closely with an electronics company, Ash Electronics, to develop the new camera which is designated the Copilyn SAS4.

Halco is hopeful to break the foreign domination of this market by its low cost but sophisticated product. It represents the largest investment ever made by the company. More details of the product on 0784 61332.

Photocopiers

Volume

A STATISTICAL multiplexer for use with the VAX and PDP-11 range of computers have been launched by the Digital Equipment Corporation. It allows up to eight asynchronous terminals to be connected to the computers. DEC says that the multiplexer is compatible with its existing DZ11 8-line interface and dramatically cuts modem and line costs.

CONTRACTS AND TENDERS

AMENDED NOTICE

GUYANA SUGAR CORPORATION LIMITED

INVITATION TO TENDER TO
FIELD AND FACTORY EQUIPMENT
AGRICULTURAL SECTOR LOAN
GUYANA SUGAR CORPORATION LIMITED

Tenders are hereby invited from suppliers for provision of field and factory equipment to be acquired under the Referenced Loan. The Inter-American Development Bank is partially funding a rehabilitation programme under Loan Contract 660/SF-GY through its fund for special operations. Eligibility with respect to origin of goods and services will be determined pursuant to the rules applicable for the use of the fund.

Tenders will be invited for the following equipment which are divided into Lots indicated in the contract documents:

LOT A FIELD EQUIPMENT
A 1 — Thirty-seven (37) Tractors up to 100 hp
A 2 — Fourteen (14) Tractors above 100 hp
A 3 — Earth moving equipment
A 4 — Agricultural implements
A 5 — Field pumps

LOT B FACTORY EQUIPMENT
B 1 — Electric motors
B 4 — Generator sets
B 5 — Complete mud filters
B 6 — Machine tools
B 7 — Indicator and control systems

Specifications contained in the tender document permit offers of alternate equipment which have similar characteristics and provide equal performance and quality to those stated.

Tenders documents can be obtained at the office of:
Guthrie Booker Merchants International Limited
Audrey House
16-20 Ely Place
London
EC1N 6SN
or
Guyana Sugar Corporation Limited
22 Church Street
Georgetown
on request and against a non-reimbursible payment of Guyana dollars 150 or equivalent in foreign exchange by crossed cheque in favour of the Guyana Sugar Corporation.

Amendments to the original tender documents will be circularised. Tenderers who have already submitted a bid in response to the original call for tenders should confirm their original bid or submit new bid. This new bid will supersede the original bid.

Tenders shall be in English and delivered in plain sealed envelopes which in no way identifier the tenderer to the following address:
The Chairman
Central Tender Board Committee
Guysuco Rehabilitation Programme
Agriculture Sector Loan
c/o Ministry of Finance
Main and Urquhart Street
Georgetown
Republic of Guyana
South America

Tenders close at 14.00 hours (2 p.m.) Guyana time on Wednesday August 3 1983. Tenderers or representatives may be present at the opening of the tenders.

A. Y. LUCK
Finance Director
Guyana Sugar Corporation Limited
22 Church Street
Georgetown
Guyana
South America

REPUBLIQUE ALGERIENNE DEMOCRATIQUE ET POPULAIRE

(Algerian Popular Democratic Republic)

MINISTERE DE L'ENERGIE ET DES INDUSTRIES PETROCHIMIQUES
(Ministry for Energy and Petrochemical Industries)

ENTERPRISE NATIONALE DES TRAVAUX AUX PUITS
(National Company for the Exploitation of Oil Wells)

ADVICE OF EXTENSION OF TENDER

The Entreprise Nationale des Travaux aux Puits: 2, Rue du Capitaine AZZOUG - Côte Rouge - Hussein Dey - ALGER ALGERIE (ALGERIA), wishes to inform interested companies that International Tender number 914.AE/MF for the supply of:

01—GD Air Winch (Well Winch) type HMKL 61281
02—Electric Winch with electrically operated brake, make STONL type OC 2040 with Electric Motor
03—Injection head NAT. N. 815
04—12/18 Desanding Devices "on Skid"
05—12/16 Desanding Devices "on Skid"

the original closing date of which was 7 May 1983, has been extended to 18 June 1983.

INTERNATIONAL TENDER FOR THE PURCHASE OF SHOP EQUIPMENT AND MACHINE TOOLS

INVITATION No. T-06/75

The Provisional Military Government of Socialist Ethiopia, Ethiopian Transport Construction Authority, announces the release of an International tender for the purchase of Shop Equipment and Machine Tools.

A loan is available from the African Development Fund (A.D.F.) and interested bidders from member countries and participating states of the A.D.F. are requested to collect bid documents during office hours from the Procurement Office Room 106, of the Ethiopian Transport Construction Authority against payment of Birr 20.00 for each set of documents.

Bids will be opened in public in the Conference Room, 4th floor, of the Ethiopian Transport Construction Authority headquarters building on July 16, 1983, at 10.00 hours Addis Ababa time.

The Authority reserves the right to reject any or all bids that are not in conformity with all conditions and specifications mentioned in the tender.

ETHIOPIAN TRANSPORT CONSTRUCTION AUTHORITY

COMPANY NOTICE

GADEK (Malaysia) BERHAD

Notice of Meeting

NOTICE IS HEREBY GIVEN that the Fifth Annual General Meeting of the company will be held at Ladang Pinji, Lahat, Perak, Malaysia, on Saturday, 11th June, 1983, at 12.00 noon for the following purposes:—

1. To receive and adopt the accounts for the year ended 31st December, 1982, and the directors' and auditors' reports thereon.
2. To sanction the payment of directors' fees.
3. To re-elect directors.
4. To appoint auditors and to authorise the directors to fix their remuneration.
5. To transact any other ordinary business.

By Order of the Board
OH KIM SUN
MAK HING KWAI
Secretaries

Ladang Pinji
Lahat, Perak
Malaysia
23rd May, 1983

NOTES

(1) A member of the company entitled to attend and vote at the meeting is entitled to appoint a proxy to vote in his stead. A proxy need not be a member of the company but unless he is, then by the provisions of Section 149(1)(b) of the Companies Act 1965, he must be a qualified legal practitioner, an approved company auditor or a person approved by the Registrar of Companies.

(2) The instrument appointing a proxy must be deposited at the registered office of the company not less than 48 hours before the time set for the meeting.

THE MANAGEMENT PAGE

EDITED BY CHRISTOPHER LORENZ

Kevin Done on the outcome of Saab-Scania's shift in strategy

Specialisation powers a recovery

"TODAY we are not ashamed of the balance sheet, but five years ago we had to be," admits Alv Elshult, executive vice president and finance director of Saab-Scania.

For many long years, Sweden's seventh largest industrial corporation has been clawing its way back to financial respectability. "We did not talk of a critical situation," says Elshult, "but in my opinion we were very close."

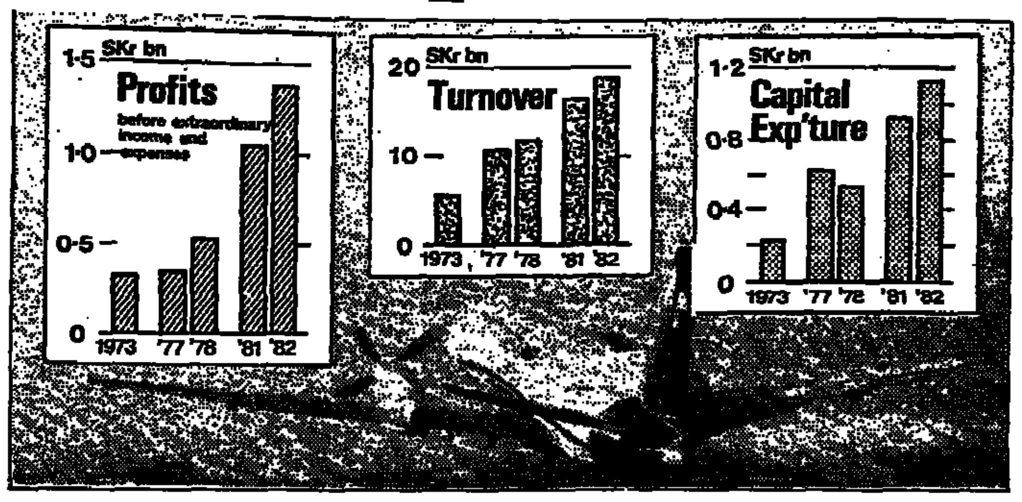
After years in the doldrums, Saab-Scania, a cornerstone of the powerful federation of Swedish financial and industrial corporations dominated by the legendary Marcus Wallenberg, is finally reaping the benefits of a far-reaching shift in corporate strategy and an ambitious investment programme, which dangerously stretched its finances during the late 1970s.

In stark contrast to the diversification spree undertaken by Volvo, Sweden's biggest industrial group and Saab's only domestic automobile competitor, Saab-Scania has chosen very consciously to concentrate its activities in a small number of markets and within these areas to specialise in small, clearly defined segments but on an international basis. "The sooner you come to the conclusion you cannot do everything, the better," says Elshult.

Such thinking lay behind the decision to abandon the computer sector. "We invested an awful lot of money and lost a lot of money in computers," admits the finance director. "I never thought we could fight with the giants, we did not have the resources." Sperry Corporation of the U.S. acquired Saab-Scania's shareholding in Saab-Univac in 1980 and at the end of that year the group sold its shares in Datasaab to L. M. Ericsson.

Resources have been concentrated in specialised segments of the transportation market (heavy trucks and buses, high performance cars and short-haul civil aircraft), priority status has been given to the expansion of international marketing, and the company has sought out substantial foreign partners to share the growing burden of research and development costs.

The move into the executive and luxury car market is finally paying off with the emergence of a model, the Saab Turbo, that can challenge the acknowledged West German masters in this sector at their own game.



Saab-Scania has shown substantial progress in the past three years. The joint venture Saab-Fairchild 340 turbo-prop civil airline (above) is seen by the company as the salvation of its aviation activities

At the same time a far-reaching technical co-operation is under way with Fiat/Lancia of Italy to support the development of a new Saab car model for the late 1980s.

Co-operation with Fairchild Industries of the U.S. will see the launch of a new short-haul aircraft next year, Saab's first civil aerospace venture since the 1950s.

Sten Gustafson, recently promoted from managing director to chairman of Saab-Scania—a position held until 1980 by Marcus Wallenberg — accepts that as recently as two to three years ago the company "was fraught with uncertainty." Some of the darkest clouds were hovering over the group's aerospace activities, which were dangerously dependent on one customer, the Swedish state, and one product, the Viggen fighter aircraft, due to be phased out by the late 1980s.

Saab decided that the salvation of aircraft activities lay in breaking into the fiercely competitive civil aircraft market, a risky move but an area where it could exploit high technology know-how already gained from its military aviation programmes — which it had certainly failed to do previously. Together with Fairchild, it opted at the beginning of 1980 to develop a twin-turbopro, 34-passenger regional airliner and executive aircraft, the Saab-Fairchild 340.

The 50/50 joint venture has a break-even point of around 200 planes. About 100 orders have been taken to date and Saab is betting that a world market for 1,500-2,000 regional aircraft of this size exists between 1985 and the end of the 1990s. Remarkably, it is the first airliner ever developed by partners on opposite sides of the Atlantic.

With a record development time, Saab and Fairchild maintain they have stolen a march of at least 6-12 months on the main competitors, De Havilland of Canada, Embraer of Brazil and a state-owned Franco-Italian consortium. First delivery is scheduled for April next year and the new plane shows the earnest of Saab's attempt to wean itself away from the military sector and the whims of Government purchasing policy.

That said, however, prospects for military aircraft production have now brightened with the go-ahead for the state for the development of a new multi-role combat aircraft, the JAS 39 Griben (Griffin).

Saab-Scania's survival during the dark years up to 1980 — for most of the 1970s the car division was losing money — was only made possible by the strength of the Scania truck operations, which have regularly generated more than 80 per cent of group profits.

For the moment, the Scania trucks operation appears to have retreated into its shell, however, under the shock of the worst crisis the world's heavy truck industry has suffered in the post-war period.

The biggest single market of the last two years, Iraq — larger even than the home market — has collapsed from sales of 3,900 units in 1981 to barely a few hundred this year. Scania has at least been able to better its share of the sinking markets in West Europe and South America, however, and its truck profits have not declined as sharply as the fall in production volume.

Truck and bus output slumped to 20,900 last year compared with 27,700 in 1980 and 25,200 in 1981. Concentrating on trucks of 16 tonnes and above, Scania accounts for 15 per cent of the total world export market for heavy trucks, ranking behind only Daimler-Benz and Volvo and ahead of rivals such as Iveco and MAN. Excluding the eastern bloc, Scania took around 5 per cent of world production in this class last year.

Its commercial vehicle manufacturing operations in Brazil and Argentina—it held 46.1 per cent of the Brazilian heavy truck market and 52.8 per cent in Argentina last year—have suffered serious setbacks given the turmoil in the local economics, but Scania is still seeking to expand assembly operations in developing countries.

Setbacks on the truck side have not been sufficient to deter the company from seizing the opportunity offered by the general recovery in the group's fortunes—profits (before extraordinary income and expenses) rose by 32 per cent last year to SKr 1.38bn ($184m) on a 16 per cent increase in turnover to SKr 18.7bn—to launch a SKr 566m rights issue, one of the biggest calls on domestic shareholders for new funds ever made by a Swedish corporation.

Of total turnover last year of SKr 18.7bn, trucks and buses accounted for SKr 7.7bn (41 per cent), cars for SKr 5.8bn (31 per cent) and aerospace SKr 1.7bn (9 per cent). The group also enjoys a profitable sideline as the Swedish importer for Volkswagen/Audi.

To prevent new product development being dwarfed by the major divisions, Saab has reorganised these areas into separate companies in recent months with the establishment of independent profit centres. Saab-Scania Combitech, created in January, is the umbrella for independent operating units covering areas such as missiles—both the Swedish and Finnish navies are buying a new Saab anti-ship missile and the airborne version will be used in the group's new JAS 39 fighter aircraft—satellite systems, electronics, precision mechanics and optics.

Another subsidiary created a little over a year ago, the ASJ group, brings together products for industrial process monitoring and control as well as heating and energy recovery.

A measure of the hole that Saab dug for itself was the massive increase in its dependence on borrowed funds during the mid-1970s. In four years to the end of 1978 long-term debt more than trebled to SKr 2.6bn from only SKr 800m in 1973. In the same period, its debt/equity ratio slumped from 45.3 per cent in 1973 to 29.8 per cent in 1977. "At under 30 per cent, you don't have much room for manoeuvre," admits Elshult.

Three highly profitable years in booming international truck markets in 1978, 1979 and 1980 helped to stop the rot, however.

"We were lucky that the earlier investments were good and that profits increased in time," says Elshult. The result is that equity funds have been pushed back up to 42 per cent of the balance sheet and investments over the last five years have been carried out largely from the group's own resources. Capital investment from 1978 to 1982 totalled SKr 3.75bn—of which 89 per cent was spent in Sweden last year—and was topped by research and development spending of SKr 4.3bn.

After a big improvement in 1979, profitability slipped back slightly in the following two years before surging ahead again last year. Boosted by the best performance of the car division since production began at the end of the 1940s, Saab is already predicting higher profits for 1983

"WE ARE the world champions in low-cost development," says one executive of Saab's car division. On the face of it, the group has performed a miraculous sleight of hand. It decided in 1979 to abandon the building of small passenger cars—the first two-stroke Saab of the 1950s was a sort of Nordic answer to the Volkswagen "Beetle" and its direct descendants survived until 1980—in order to concentrate solely on the upper-middle segment of the market with more exclusive models capable of competing on export markets.

This is the segment where Saab hopes it can make money despite small production volumes.

The model chosen to spearhead the campaign, the Saab 900, first presented in 1978, is itself only a development of the Saab 99 which was introduced as long ago as 1968. It was not the most obvious launching pad.

The transformation in Saab's image from the producer of small family cars of rather eccentric appearance to the maker of high performance saloons for the sporty executive and well-heeled professional centres around one word—"Turbo."

Even here the basic technology was not new—Scania, which supplies the engines and transmissions for the Saab car division, has been producing turbo-charged diesel engines for trucks for decades. But Saab-Scania was the first on the world market in 1977 to introduce a successful turbo-charged petrol engine for the car designed for normal motoring and not for the race-track.

Saab is now developing its third generation of turbo-charged passenger car engine. Its success can be judged by the number of imitators around the world that have been forced to incorporate turbo principles in their own engine design and product image.

The demand for Saab's Turbo cars has helped boost car production from 65,800 in 1980 to 83,500 in 1982. By the end of last year, Saab was producing at a rate of 90,000 cars a year and output will have been increased to 100,000 by the end of 1983. The impact on profitability has been dramatic. After years below the break-even point in the 1970s, the booming profits of the cars division are more than making up for the decline in earnings from the trucks division.

Volume sales to the U.S. jumped by 24.1 per cent last year and rose by another 52 per cent in the first quarter of 1983 compared with the same period last year.

Turbo provides fresh impetus

Marketing has been intensified most notably in the U.S., the UK, West Germany, Italy and France with efforts concentrated on strengthening the dealer and service network.

Saab has been a pioneer in reorganising assembly line operations with the establishment of "autonomous work groups" to cut the monotony of assembly line work. It has been slower to automate, but this is changing with the advent of more flexible robots suitable for lower production volumes. Around 20 robots are in operation today at its Trollhättan plant in Western Sweden and a further 60 will have been installed by 1984-85.

Saab produces fewer of its own components than the big car makers but aims to gain economies of scale by buying-in parts from the large components manufacturers, chiefly in Sweden, West Germany, the U.S. and the UK. "For the future, we are trying to concentrate on a smaller number of suppliers—(it currently has 415)—to cut material handling costs and administration," says Rolf Sandberg, production vice-president.

Saab tries, in addition, to use the development resources of its suppliers to supplement its own R and D organisation.

Recognising its limitations as a small producer, Saab has joined forces with Fiat/Lancia in a far-reaching technical co-operation in order to develop its new car generation. The next model will be a further move up market beyond the 900 series—the launch is due in the second half of the 1980s.

In another co-operation deal with Fiat, Saab already markets the Lancia Delta (sold as the Saab-Lancia 600) and the Autobianchi 112 in Sweden in order to expand the range of cars available for its domestic dealer network.

On a world scale, Saab remains a small car manufacturer, but within its chosen sector it is carving out an appreciable presence against the main competition of BMW, Mercedes-Benz, Volvo, Audi and Rover. It claims a market share in this segment in West Europe and North America of 4.7 per cent, up from 4.1 per cent in 1981, but a lot is riding on the durability of the Turbo image as a successful marketing tool.

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Over-the-Counter Market

£000's capitalisation	Company	Price	Change on week	Gross div. (p)	Yield %	P/E Actual	P/E Fully taxed
4,465	Ass. Brit. Ind. Ord. ...	134	—	6.4	4.8	7.8	10.2
—	Ass. Brit. Ind. CULS...	152	+1	10.0	6.6	—	—
3,705	Airsprung Group	64	+2	6.1	9.5	18.3	18.3
700	Armitage & Rhodes......	28	−1	4.3	15.4	3.1	5.6
21,080	Bardon Hill	345	+15	11.4	3.3	14.5	18.3
1,863	CCL 11pc Conv. Pref....	149	—	15.7	10.5	—	—
3,320	Cindico Group	210	—	17.6	8.4	—	—
3,569	Deborah Services	46	−1	6.0	13.0	3.0	8.2
6,282	Frank Horsell	98	—	—	—	8.0	8.6
—	Frank Horsell Pr Ord 87	94½	—	8.7	9.2	10.5	11.3
8,957	Frederick Parker	62	—	7.1	11.5	3.9	6.2
627	George Blair	34	—	—	—	6.9	12.3
3,087	Ind. Precision Castings	76	—	7.3	9.6	9.7	12.3
4,200	Isis Conv. Pref.	175	+3	15.7	9.0	—	—
3,770	Jackson Group	149	+2	7.5	5.0	4.6	9.5
30,778	James Burrough	223	−2	9.6	4.3	16.3	18.1
1,520	Robert Jenkins	149	+1	20.0	13.4	1.6	23.7
3,420	Scruttons "A"	67	—	5.7	8.5	8.7	10.5
2,783	Torday & Carlisle	114	+4	11.4	10.0	5.1	8.6
4,082	Unilock Holdings	26	—	0.26	1.8	—	—
8,542	Walter Alexander	67	—	6.4	9.6	4.8	6.9
6,165	W. S. Yeates	265	—	17.1	6.5	4.1	8.5

Prices now available on Prestel page 48146.

THE ARTS

Beethoven's Tenth/Vaudeville

Michael Coveney

Ustinov's return to the London stage

Beethoven's lost sketch books indicated that he was at work on several compositions when he died, including a Tenth Symphony. What would it have been like? Longer than the Ninth and with more singers, warbling in Ancient Greek, suggests the reincarnated composer, heaving with merriment (and difficulty) on a chair of canvas and chromium in the London home of a leading music critic.

Peter Ustinov has impersonated Dr Johnson and Socrates in his time, so there seems no good reason why he should draw the line at Ludwig. To this end he has built himself an intermittently amusing but hardly robust vehicle which he clambers aboard when the critic's Austrian au pair (Clare Higgins) summons him from the grave.

The critic is writing a book on the "Tenth," but has no time to attend his son's own symphonies. He is vain, arrogant, tall and pleased with himself. The au pair intervenes in a domestic row over the reception of young Pascal's latest effort, and the door knocker thumps in echo of the Fifth Symphony's opening chords.

Mr Ustinov struts on muttering German to himself in that self-contained air suggested by the Lyser drawings. It is the first hint that the heroic sculptures with their tempestuous scowls are not the model. The coat is indeed grubby, the physical presence bear-like, truncated. But Mr Ustinov tempers the coarse guzzling of food and goosing of the au pair with his characteristic stage vagueness and nimble turn of phrase.

When left alone with Pascal, he demolishes the boy's work in terms of abuse more foul than the critic's. This is after being sprung into English conversation by the application to his ear of a deaf aid by a passing doctor. Once this initial joke has been milked dry, the evening subsides into a rather wearying procession of aphorisms and modestly profane variations on the biographical details.

The play is best at charting the effect of Ludwig on the critic's wife, a former singer whose career has been sacrificed to her function of catalyst between husband and son. Dilys Laye blossoms in a beautiful *lied*, accompanied tentatively at the piano by the composer who has no overpowering recollection of his own work.

The critic, Stephen Fauldgate (admirably played by Robin Bailey), asks of Beethoven the two obvious questions. The second, seeking to know the identity of the "Immortal Beloved" is a cue for an interpolated vision, witnessed by the entire family, of the Countess Giulietta (dedicatee of the "Moonlight" sonata) and Gallenberg. The latter's disdain of the composer "who smells of airless cupboards" completes the humiliation of the rejected lover.

Another over-worked myth, that of Beethoven peering at farm girls from clumps of shrubbery, is enacted with a neat plot surprise thrown in. It explains the au pair's supernatural gift and resolves the family crisis. Along the way, there are glancing parallels attempted between the father/son relationship and that of Beethoven and the nephew he called "son," Karl.

Otherwise the text trundles along the well-worn path of acrimony between the critical and creative instincts ("You have nothing to say and you say it very well" is a typical line) and Robert Chetwyn's pleasantly indulgent production allows Mr Ustinov full license to bumble, snaffle, squinny and leer in his accustomed manner.

When shown the range of Fauldgate's collection of review records, Mr Ustinov utters the startled cry "You mean critics get *presents* these days as well as bribes?" But such minor delights are rare, and when the genius is fed trolley-fuls of food while being treated to selected highlights from the *oeuvre* I even found myself warming to the memory of *Amadeus*.

Lear/Pit

Martin Hoyle

Shortly after Lear's loyal henchman had his eardrums pierced with knitting needles the first casualty from the audience was carried out insensible. The second fainting occurred as the King's eyeballs were extracted by the latest labour, if not pain, saving scientific device. Edward Bond's Lear still shocks; though these examples of violence at least seem a consistent part of the human jungle peopled by barely anthropomorphic beasts, their human features hiding the latent animality of, say, a Georg Grosz caricature.

Barry Kyle's production has transferred from Stratford; the Barbican now displays the Shakespearian original beside its modern pendant. Bond's starting point was Lear's own contribution to his unnatural daughters' natures, and the conviction that Cordelia, like any successful revolutionary, would slide into the old tyranny. He condemns not abuse of power, but power itself.

The play's animal imagery echoes its great predecessor. Elsewhere Bond can be gruesomely funny à la Charles Addams or aphoristic, with varying success. In place of the Fool, Lear is dogged by the ghost of a kindly peasant who, Bond has noted, symbolises useless nostalgia, the danger of romanticising (Mark Rylance's lugubrious winsomeness demonstrates that goodness is harder to portray than evil).

The apparent faith in natural goodness that exclaims "Your law always does more harm than crime, and your morality is a form of violence" is contradicted by the lack of conviction in the compassionate set-pieces: the wounded soldier left to die under the stars and Lear's parable of the caged bird ring false. Only at his daughter's autopsy does Lear's amazement, here beautifully expressed by Bob Peck, manage to move.

Sara Kestelman's predatory intensity includes a snappy delivery of bitchy witticisms; as her sister, Jenny Agutter is stilted: not since Grinling Gibbons has a career placed such faith in the virtues of woodenness.

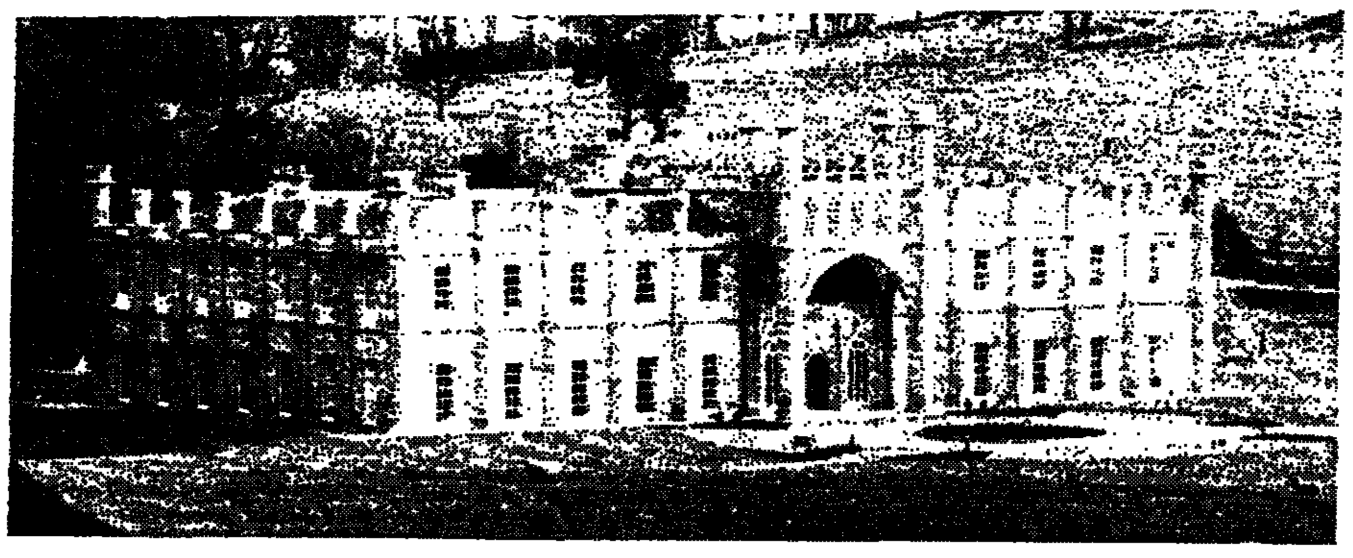
IBM's 1983 arts sponsorship

IBM UK has announced its arts sponsorship programme for 1983, comprising support to 30 events. The major one will be the Royal Academy Summer Exhibition which takes place at the Royal Academy of Arts from May 29-August 27. This is IBM's second significant involvement with the Royal Academy, and follows the successful Post Impressionist Exhibition which was sponsored in 1979-80.

Architecture

Colin Amery

Aviation business flies to the rescue



Donington Hall, built in 1793 on the borders of Leicestershire and Derbyshire, newly restored as the headquarters of British Midland Airways

There is something very inspiring and gratifying about an enterprising modern business moving into the world of architectural conservation. For an airline, in this case British Midland Airways, to buy as its headquarters a crumbling ruin of a grand late 18th century country house is a highly unlikely event.

Donington Hall at Castle Donington on the Leicestershire, Derbyshire borders is, by any standards, an interesting house. It was built in 1793 for the first Marquis of Hastings and designed by William Wilkins, the father of the Wilkins who designed the National Gallery. It stands in a beautiful park, lying peacefully at the bottom of a shallow bowl of hills. The park today bears only traces of its 18th century planting.

It is a splendid site and a fascinating house. The main façade is 11 bays wide and two storeys high. The windows are divided from each other by gothic-style polygonal buttresses, each one ending in little castellated turrets. At the centre of the main façade is a tall, vaunted porch that rises to almost the full height of the house and supports a belvedere —a room with an almost entirely glazed front wall looking over the park.

There is no doubt that this is an early attemt at a Gothic house and its interest is to see how it still follows the regularity of the classical models. The great Gothic porch is the nearest thing that a Gothicising architect could get to a portico.

The house is faced with a lovely mixture of local stone, the roof is covered with greenish grey textured slate. The symmetry of the main front is broken by the added chapel with its perpendicular windows.

Donington has suffered and been saved. In the First World War it was a Prisoner of War camp for German officers. In the Second World War it was a billet for officers and the park was the largest army vehicle depot in England. Between the wars it was a family home for a while and an hotel.

Since the last war its fortunes have fallen badly despite attempts by the owners to rejuvenate the estate. It has been a welcoming home for Hungarian refugees and for children of the Ockenden Venture. Until 1979 the house had been empty for 10 years and serious decay and rot had set in.

Because the house was only minutes away from the East Midlands airport it was bravely purchased with 29 acres of parkland (with permission to develop six of them) by British Midland Airways. They have spent £1¾m on the restoration of the house and its conversion to a workplace for 400 staff.

The highly skilled construction and repair work has been carried out by a local Derby company, Ford and Weston under the project management control of Project Consultancy Group, from Nottingham. The architects were the James McArtney Partnership, also of Nottingham.

To transform a near derelict house that was riddled with all known varieties of rot into a headquarters for a company that need the latest technologies is by any measure impressive. Plaster ceilings have been beautifully restored and elements of new plasterwork carefully inserted.

What is very clear when touring the house is that the original plan is a logical one. There is an impressive entrance hall and main staircase, suitable for impressing clients today. The great rooms on the ground floor make elegant open plan offices, with glorious views of parkland. The chairman and his cohorts have grand offices on the first floor and the top floor with the belvedere is ideal for company hospitality.

It would be unreasonable to expect the headquarters of a growing airline to retain the atmosphere of a late Georgian country house—computers in the lower floors have replaced the housemaids. I do feel, however that the architectural advice to match the noble intentions of the company has not been of the highest possible standards.

In the marvellous hall and oval staircase, for example, there are several errors of taste that mar the good intentions. The Gothic hall should not have to suffer the inelegance of the new "Gothic" internal porch. Spotlights and brown fitted carpet should be replaced in time by a flagged floor and lanterns.

The walls of the main staircase should never have been covered with the woodchip paper—and a little research would have revealed some of the original colours. There is nothing 18th century about the browns and beiges that architects today seem to love so much.

The chapel is a ruin at the moment—only with substantial grants can it be restored. It was remarkable for its plasterwork and its cast iron stalls.

On the vexed question of taste and historical accuracy—it has to be admitted that architects today are woefully ignorant. This house should have received the dedicated attention and advice that the Historic Buildings Council for England and the Georgian Group could so easily provide. It is a subtle and delicate business and one that can only be learned slowly.

The National Trust could make its advice more available on a commercial basis if it felt able to take more of a dive into the market place. Offices are not incompatible with these houses and this exercise shows that there are enlightened companies willing to step in and I am sure they would be willing to learn and pay for the skills to ensure a more accurate and feeling restoration of country houses.

Walking on Walter/Liverpool Playhouse

B. A. Young

Fans of *Trafford Tanzi* must not expect the new play by its author, Claire Luckham, to be like it in style or content. Eight of its nine characters spend the evening on a sponsored walk in aid of an Amnesty International victim called Walter, languishing in a Chilean prison. Two of these eight are only in charge of the refreshments; the odd one out is a woman living in a caravan, who provides five minutes' fun, but has little to do with the rest of the play.

The six proud walkers are caught at various moments as they tramp the gaily changing scenery of Ellen Cairns's designs for Salisbury Plain, and at rather long intervals we learn by emotional mosaics what they're up to. Sonia (Cheryl Kennedy), newly married to Justin (Christopher Martin), is determined to do her walking best for Walter, before her knees give out. But Justin is having a sneaky affair with John's wife Viv (Fiona Mollison), though he has to devote a lot of time to keeping his young pupil Steve (Joshua le Touzel) out of the clutches of the gay chemist Donald (David Fielder). Steve is perfectly happy with Donald and even turns down a sexual approach from the newly-widowed Celia (Anna Nygh), who finds sex and tears the cures for her widowhood.

And now I've told you everything, except that Viv's husband John (Hugh Fraser), who is doing the refreshments with Mildred (Patricia Leach) is a drinking solicitor about to go bankrupt, and Mildred is beginning to feel her age. An occasional phrase suggests that Ms Luckham (who collaborated on the play with Debbie Horsfield) has a theme to impart about the relation of the sexes. "Why are men always so pathetic?" Viv wails when Justin suggests amplifying their games into an affair. But there's no real theme, only small-talk, some of which has to be stimulated by such unlikely provocations as a caged monkey untended in the woods, or the caravan-dweller who is not a gypsy.

Donald and Sonia are both given to convenient soliloquising, though they don't take enough advantage of the habit to let up deep into their souls. There are indeed no depths to plumb, as far as I could see, in theirs or any others. As Ms Luckham has ended the play with a comic punch-line, I take it she has nothing urgent to tell us.

I like the scenery, with the ordnance maps printed on every chalk outcrop; and the direction by Bill Morrison, is as brisk as a script so full of pauses and so empty of drama can permit.

TV drama award for ex-cricketer

A former county cricketer has been voted top TV playwright in the *Radio Times* drama awards. Peter Gibbs, who played for Derbyshire in the 1970s, won with his play *Benefit of the Doubt*, about the blooding of an umpire in a first-class game. He has written 10 radio plays for the BBC, two of which will be broadcast this year.

Joint winners of the Radio Playwright Award were teacher Stephen Dunstone for his play *Who is Sylvia?* a tragic comedy, and freelance writer Christopher Russel for his comedy, *Swimmer*.

Andrew Graham, 18, won a special prize for his TV comedy about a family *On Any Other Day*.

Enrique Perez de Guzman

Max Loppert

Enrique Perez de Guzman is a young Spanish pianist of rare qualities. The national adjective is not fully pertinent to or explanatory of them, though in Saturday's Wigmore Hall recital the first-half playing of a Granados selection was informed by a magisterial, and indeed faultless, comprehension of style that probaly only comes to the native interpreter.

Yet Mr Perez de Guzman would probaly stand out as a musician of distinction whatever his origin: for he combines a virtuoso technique—mettled to the point of taking the most punitive Granados repeated-note figuration, the headiest bel canto glitter of the Chopin *Grande Polonaise Brillante*, in an easy stride — with an unusually relaxed, measured interpretative manner.

The combination lends his execution a sense of reserve that could be taken for coolness (the last time I heard Mr Perez de Guzman in recital, in 1976, that is how I took it). Now, with the artistry matured and in control of every point and paragraph, the totality adds up to something rather more interesting and potent than that.

The slower numbers of the Granados *Goyescas* piano-poems can have their longueurs, their moony, meandering sequences—even the New Grove Granados entry admits to the possibility. Remarkably, in the first book of four, which Mr Perez de Guzman then closed with an exhilarating *El pelele*, there was not the faintest danger of tedium. He spun out the melodic phrases with that particular mastery of line which sees to overall shape as much as to immediate poetic effect.

The variety of timbre and texture — bright and brilliant in *El fandango de Candil*, rapt and silken in *Los requiebros* and *La maja y el ruiseñor* — was compendious, yet it was above all the immaculately finished lyricism for which this half of the concert proved so unexpectedly compelling.

The Chopin selection that followed was, in its way no less remarkable. At first, in a Berceuse and Barcarolle so evenly and equably began as to seem almost pedantic, one wondered whether the voltage was not running a little low; but in each case the performance was being fastidiously shaped to lead to a grandly sustained climax.

In an encore group of Mendelssohn, Soler, and a *Ritual Fire Dance* of quite marvellously aristocratic excitement, Mr Perez de Guzman summed up what the main body of the recital had already demonstrated: that his kind of playing is quite out of the common run of today's pianists. His next London recital (QEH, January 1984) should not be missed.

Eric Ackroyd/Coliseum, Oldham

B. A. Young

The Great Eric Ackroyd Disaster begins when Eric, the champion cougher of Grindlay's Smoke Works, allows two seconds of fresh air to pollute the sky over Badchester. The sky, as we see over the stage, is normally thick with black effusions from which birds fall now and then, asphyxiated. One or two fatalities result, and Eric is exiled to London in disgrace, in spite of his being needed for the works team in the Coughing Cup final at Wembley.

Bill Tidy, the author of this enjoyable romp at the Oldham Coliseum has adapted it from its original shape as a book of comic drawings. More than most other cartoonists, he likes a continuing story; we have had *The Fosdyke Saga* and *The Cloggies* and *The Last Chip Shop*. His writing runs like a series of cartoons, without any dull connecting material.

So in London, Eric (given a properly stereotyped performance by John McArdle) meets Nellie, the winner of The 1975 Golden-Hearted Whore Trophy (Barbara Rosenblat) at a strip club, and moves in with her, paying no heed to the streams of sailors who help them pay the rent. Before we know where we are, he has become a chat-show star with a newspaper column, and is invited to a Buckingham Palace garden party.

Aiming even higher, he demands, on a visit to Downing Street, that he should be made prime minister. The serving prime minister is horrified, and ensures that Eric is disgraced once more for his association with sailors and his adiction to Soapo, an intoxicant cleaning fluid. He quits public life, and sinks to the dregs; but Nellie tracks him to the Hospice of St Devius, where he is lying in a coma. Overhearing the words "Coughing Cup" he recovers at once, and secretly joins his old team for its final against Battersea Power Station (who were played on my visit by the Rossendale male voice choir). The Badchester team wins, of course, and Eric is a hero again.

The humour is very broad, and seldom improper. There are some pretty songs with music by Brian Jacques; the best of them go to Miss Rosenblat, who has to work hard to beat the four brass instruments conducted in the pit by Mark Vibrans. I found it all very funny; it is closely tailored to Lancashire tastes, but intellectuals allergic to these can reflect that in a way you could call it satire.

Pat Trueman is the director, and Peter Skerrett has combined with the author in the designs.

Houston Ballet's British debut

Houston Ballet, one of America's leading ballet companies, will make its British debut on a tour from June 13-July 9. The company will appear at the Birmingham Hippodrome (June 13-18), at Sadler's Wells Theatre, London (June 20-July 2) and at the Palace Theatre, Manchester (July 4-9).

Houston Ballet was established in 1967 under the artistic direction of Nina Popova, although its foundations were laid eight years earlier with the creation of the Houston Ballet Academy headed by Tatiana Semenova.

The company, which now numbers 38 dancers, has grown to a point where it performs almost the whole year round and has toured all over North America. Its repertoire ranges widely from the classics to contemporary works as well as new pieces specially created for the company by some of the world's leading choreographers.

In April 1982 the company undertook its first European tour, visiting France, Italy, Switzerland and Luxembourg.

British-born Ben Stevenson has been the company's artistic director since 1976.

For the British tour the company will present three different programmes including Stevenson's full-length ballet *Peer Gynt*, based on the play by Henrik Ibsen, with the incidental music by Greig arranged by John Lanchbery.

Arts Guide

Music/Monday. Opera and Ballet/Tuesday. Theatre/Wednesday. Exhibitions/Thursday. A selective guide to all the Arts appears each Friday.

Music — May 20–26

ZURICH

Tonhalle: Zuricher Chamber Orchestra with Maud and Paul Torelier, cellos conducted by Edmond de Stoutz. Handel, Dvorak, Vivaldi and Grieg (Tue); Homera Francesch, piano (Wed).

VIENNA

Konzerthaus (721211): Vienna Chamber Orchestra, conductor Philippe Entremont. Mozart (Wed); Radio Symphony Orchestra, Berlin, Vienna Youth Choir. Conductor Riccardo Chailly. Eben, Gounod and Liszt (Thur).

Secession. Festival of New Music. Die Tödliche Doris/Butzmann/Z'ev from Berlin (Tue); The Residents (Wed).

LONDON

Halle Orchestra conducted by James Loughran with Peter Donohoe, piano. Berlioz, Rachmaninov and Mahler. Royal Festival Hall (Mon). (928 3191).

London Sinfonietta conducted by Oliver Knussen with the Arditti String Quartet and Electric Phoenix. Britten, Maxwell Davies, Holloway, Ferneyhough and others to celebrate the 40th anniversary of the Society for the Promotion of New Music, includes four world premieres. Barbican Hall (Mon). (638 8891).

English Chamber Orchestra directed by Murray Perahia, piano. Mozart. Royal Festival Hall (Tue).

English Bach Festival: Trevor Pinnock, harpsichord. Bach and Rameau. Queen Elizabeth Hall (Tue). (928 3191).

Philharmonia Orchestra conducted by Simon Rattle with Misha Dichter, piano. Strauss, Beethoven and Dvorak. Royal Festival Hall Wed).

London Mozart Players conducted by Tamas Vasary, piano. Mozart, Janacek and Haydn. Queen Elizabeth Hall (Wed).

Young Musicians Symphony Orchestra, Harlow Chorus and Nelp Chorus conducted by James Blair. Elgar's The Dream of Gerontius. Royal Festival Hall (Thur).

Ronnie Scott's. Frith Street: Dizzy Gillespie, trumpet. Until June 1. (439 0747).

PARIS

Los Angeles Philharmonic Orchestra with Carlo Maria Giulini, Gidon Kremer, Yo-Yo Ma: Brahms (Mon) Salle Pleyel (563 8873).

Colonne Orchestre conducted by Lovro von Matacic with Colonne Orchestra choir conducted by Jean Sourisse: Bruckner (Tue) Saint-Louis-Des-Invalides Church (233 7289).

Concerts Lamoureux Octet: Schubert (Thur 3pm and 8pm) Salle Pleyel-Salle.

Christian Debrus, piano with the Republican Guard's Symphony Orchestra: Haydn, Ravel (Wed) Salle Gaveau (563 2030).

Orchestre de Paris conducted by Rafael Kubelik with Brigitte Fassbänder and the Paris Orchestra choir conducted by Arthur Oldham: Mahler symphony 3 (Wed, Thur) Salle Pleyel (563 0796).

Scottish Chamber Orchestra with Teresa Berganza: Haydn, Mozart, de Falla, R. Strauss (Thur) tmp-chatelet (261 1983).

NEW YORK

Alfred Brendel: piano recital. Beethoven programme (Mon, Thur). Carnegie Hall (247 7459).

Guarneri String Quartet: Brahms programme (Tue, Thur). 92nd St. Y. 1395 Lexington Av (427 4410).

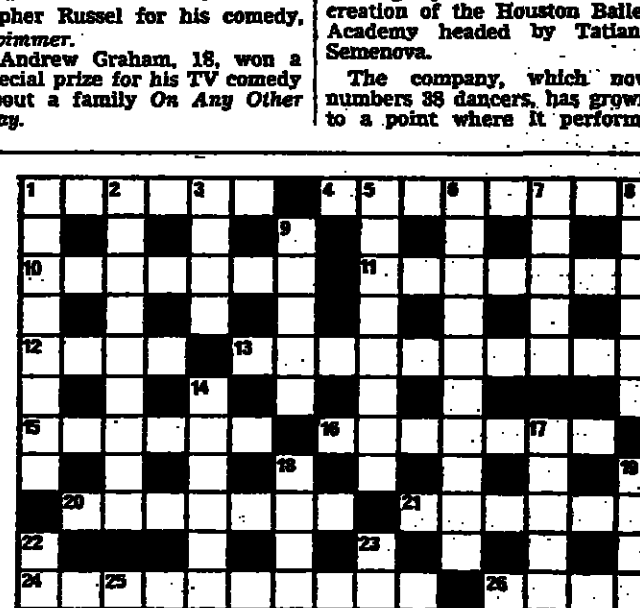
WASHINGTON

National Symphony: Mstislav Rostropovich conducting. Gwendolyn Bradley soprano, Claudine Carlson mezzo-soprano, Choral Arts Society directed by Norman Scribner. Mahler (Tue, Wed, Thur). Concert Hall, Kennedy Center (254 3776).

CHICAGO

Chicago Symphony: Leonard Slatkin conducting. Hanlon, Sibelius, Vaughan Williams (Thur). Orchestra Hall (435 8122).

F.T. CROSSWORD PUZZLE No. 5,178



ACROSS

1 I am in a rage it appears (6)
4 Stop or start playing billiards (5, 3)
10 New cadet or old soldier (7)
11 Prominent foreigner in the way (7)
12 Always puts a woman right (4)
13 They impressed old sailors (5, 5)
15 Stay outside or go (6)
16 A fine kick (7)
20 Lying in a case, perhaps (7)
21 Stop and have a drink (6)
24 Coastal defence that is soon liquidated? (4-6)
26 I need nothing, thanks, or very little (4)
28 Having a roof over one's head (7)
29 Man in a whirl—engine fuel his trouble? (7)
30 May never be enough for anybody (8)
31 Badly teased, but not standing for it (6)

DOWN

1 Wanting to rest in peace? (3-5)
2 He is named for the post (9)
3 Gathered to be all right (4)
5 Sees dirt, becomes revolted (8)
6 Loyalty is required, for instance, in a union (10)
7 It can smash a canoe to pieces (5)
8 He's fit to be an object of worship (6)
9 Open tarts, perhaps (5)
14 Flight path designed to carry jet (10)
17 He will leave a permanent impression upon one (9)
18 Man's environment — geographically speaking (5, 3)
19 An outhouse in which there's warmth—just in case (8)
22 Have ambitions for a high place in the church? (6)
23 It's used in a row or swordfight (5)
25 Give someone a sharp reminder? (5)
27 Bank of Scotland (4)

The solution to last Saturday's prize puzzle will be published with names of winners next Saturday

FINANCIAL TIMES
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Monday May 23 1983

Heart of the Euromarket

A SHORTAGE of about $1.5bn in interbank deposits is the stumbling block now hindering a solution to Brazil's second debt crisis within a year. They are deposits which some banks involved in lending to Brazil have chosen to withdraw from Brazilian banks. The argument whether such western banks should be coerced into restoring these deposits has led to an open division between central banks which, until now, have given an impression of unity in their efforts to keep the international banking system intact and working.

The argument is not arcane. The international market for interbank deposits lies at the heart of the Euromarket phenomenon, and the roughly $1,000bn which international banks are now borrowing from other banks is the feedstock which has made possible many of the banking excesses of the last decade.

Provided

This interbank Euromarket has always been much more than a market in which one bank's marginal surplus of dollars is used to fund another's marginal need. In many cases it has provided the sole source of dollars for banks which have neither an American deposit base nor any well developed access to dollar deposits from non-bank customers.

In 1981, a Bank of England study found, for instance, that Japanese banks in London were raising three-quarters of their funds in the interbank market and consortium banks about four-fifths.

One particular class of such users of the market were the banks of developing countries like Brazil and Mexico. They used interbank funds to participate in syndicated loans to their own countries or to fund dollar loans to customers back at home. The interbank market thus became a back-door source of balance of payments finance: Brazil, for instance, had taken in about $7.5bn in interbank deposits compared with total debts of about $90bn.

The lure of interbank liquidity worked both ways. Some of the world's largest banks acted as conduits into the interbank market, accepting deposits from Opec countries, for instance, and then passing them on to other banks at some profit. While such money-centre banks may define and control their direct loan-exposure to troubled countries they cannot define or control their ultimate exposure, which depends on the lending policies of banks tapping the market.

Against this background, the U.S. Federal Reserve and the Bank of England have tended, not without misgivings, to adopt a pragmatic line in attempting to shore up Brazil's interbank deposits. The Bundesbank and the Swiss National Bank have taken a more purist line and remained sceptical.

We have consistently been worried by the decisions formally to include interbank commitments in the debt rescue "packages" put together by banks, central banks and the International Monetary Fund. The phenomenon of sovereign bank dept has already created illusions enough without giving official approval to the myth that money locked away in a Latin American bank is a liquid interbank deposit like any other.

It is better to tailor the refinancing arrangement—the Bank for International Settlements and IMF loans, the economic adjustments required of the borrower and the longer-term bank loans—to a realistic assessment of the borrower's financial position.

It is desirable also to put the central bank of a debtor country in a position where it can, as lender of last resort, supply some dollar liquidity to its own banks when interbank deposits are withdrawn. Some tacit agreement between Western banks on preserving interbank lines will doubtless still be needed, but the aim should be to bolster interbank confidence by putting together a credible combination of longer-term finance and adjustment.

Bridging loans from the BIS should continue to play a role but not a role that fosters illusions. The reserves of central banks, the lenders of last resort, must remain secure and predictably callable. If the supply of further funds from official sources cannot be avoided at the end of a BIS bridging period, it should be secured through the IMF or directly from governments: the BIS should not be drawn into the never-never land of balance of payments lending.

Experiences

After the differing experiences with the rescues of Mexico and Brazil it seems probable that formal reliance on interbank arm-twisting will be avoided in the future. Indebted governments, commercial banks and their supervisors have doubtless learned a lesson in the last 18 months, analogous to the warning of the dangers of the floating rate foreign exchange market delivered by the collapse of the Franklin National and Herstatt banks in the mid-seventies.

In the future, countries or banks which rely heavily on interbank finance will need to be looked at more critically by other banks and by bank supervisors. Equally, larger banks which accept deposits on the strength of their august names and then lose sight of the end-use of those funds must now be asking themselves whether that avenue to balance-sheet growth is really worth the margins and the risks involved.

REAGAN'S SUMMIT

The Williamsburg line-up: from left to right, M Gaston Thorn, EEC Commission President, President Mitterrand of France, West Germany's Chancellor Kohl, President Reagan, Premier Thatcher of Britain, Nakasone of Japan, Trudeau of Canada and Fanfani of Italy

And so, back to the fireside

By John Plender

IT IS, so many European officials would have us believe, an unstructured, high-risk affair, of which we should expect little of real consequence.

The preparations have been marked by undignified squabbling between France and the United States over exchange rate intervention. The European press is rife with scepticism.

In the United States, public interest, in so far as it exists, focuses as much on what public relations advantage the President will draw from the event as on the issues themselves. In all, a less than creditable curtain-raiser for the ninth economic summit at Williamsburg, Virginia, at which heads of government confront exceptionally serious problems of unemployment and financial instability. Yet the omens could still prove misleading.

Official pessimism about the outcome is perhaps understandable. At recent summits bureaucrats have told politicians what to do, say and think. Heads of government have been tied down to communiqués drafted in advance and have ended up spending much of the limited time available arguing about nuances of drafting. In recent years the number of functionaries has multiplied and the journalistic retinue expanded.

The summit process was thus excessively bureaucratised by 1981 when the Ottawa meeting produced little but complacency in the face of the recession. Bathos was finally achieved at the Versailles summit, the ultimate triumph of form over economic content, after which Presidents Mitterrand and Reagan succeeded in devaluing summitry by openly reassuring their respective electorates that they had conceded nothing on East-West trade or exchange rates.

The novelty of the Williamsburg summit, and the cause of much of the scepticism, is that President Reagan has insisted that the bureaucratic trappings be pared down — though the journalists will still be condemned to hunt in a pack of 6,000. Instead of a communiqué there will merely be an informal agenda and an agreed statement to be delivered by President Reagan at the conclusion.

The eight participants from the U.S., Japan, West Germany, France, Britain, Canada, Italy and the European Commission will meet on their own and debrief their ministers and civil servants without the help of an official record. The foreign and finance ministers, meantime, will meet separately and present prepared statements to the heads of government.

In effect officialdom has been put in its place. The aim is partly to return to the style of the first summit at Rambouillet in 1975, where the leaders tried to look beyond their immediate national concerns and discussed the wider international consequences of their economic policies. Instead of concentrating on the preparatory work of "sherpas," the participants will lay the emphasis on the aftermath: they will provide "orientations" — a new bureaucratic catchword for requests and initiatives which will provide the basis for negotiation.

The central issue this coming weekend will be the state of the world economic recovery and how to sustain it. Most of the leading industrial countries have recently upgraded their estimates of growth: the fall in the oil price has provided a useful stimulus; inflation is down; and nominal, if not real, interest rates have declined sharply over the past year. Yet by post-war standards the recovery remains weak and there is room for disagreement among the summit leaders on how far and how fast it is likely to go.

That does not, however, mean that there will be any commitments, as at Bonn in 1978, for a "locomotive" expansion by the bigger economies. Even the French, after successive devaluations of the franc, have abandoned their belief in old-fashioned reflationary medicine. The world's leaders seem more likely to express faith and hope in the recovery and to conduct a strategic discussion on what steps are needed to remove the obstacles to sustained, non-inflationary growth.

The more obvious obstacles include:—

- The U.S. budget deficit. Assuming no change in current economic policy, the U.S. is running a "structural" deficit —that is, one which will remain even when the economy turns up—which can be expected to mop up most of the private sector's net savings for the foreseeable future, as well as absorbing capital inflows from overseas. The deficit goes much of the way to explain the high real level of U.S. interest rates and contributes to the overvaluation of the dollar.
- Exchange rate instability. Floating exchange rates have produced an unstable framework for international trade and monetary relations. When the Bretton Woods system of fixed exchange rates broke down in the early 1970s, advocates of floating exchange rates expected currencies to adjust to underlying trade flows as they were reflected in the current account of the balance of payments. Instead currency levels have been dictated increasingly by capital account movements; current accounts have tended to adjust to currencies instead of the other way round.

Attacking the Americans is the traditional resort of a French president confronting a discontented populace

The result is an unbalanced relationship between the main currencies and particularly the dollar and the yen, whose present levels are simply not tenable in the longer run because they create inexorable pressure for protection. As the U.S. has exported demand and jobs via its balance of payments, sectoral interests have turned protection into an important political issue.

The volatility of exchange rates also hampers sustained recovery by making capital investment more hazardous: assumptions about relative costs can be turned upside down in days by sudden currency movements. Less investment is then directed towards export business and the mechanism for transmitting growth from country to country is disrupted.

- The international debt problem. The combination of high real interest rates and growing protection in the developed world makes it harder for less developed countries (LDCs) to generate export earnings and service their debts. Without access to markets, the LDCs will be unable to extract themselves from the present vicious circle whereby they are borrowing new money to pay interest on old debt. Debt deflation will act as a brake on the world economy.

These three problems of structural budget deficits, exchange rate instability and debt service are clearly interrelated. Their gravity suggests that financial interdependence has run ahead of the capacity of the leading industrialised countries to control the consequences. Yet in theory summits are intended to handle precisely these kinds of issues and to provide a forum in which statesmen can transcend narrow and departmental approaches to their solution.

It is not the job of heads of government to hammer out technicalities. What they can do is to put technical issues on the political agenda and communicate a new set of priorities to ministers and officials, particularly in those areas where there is some indication that the beginnings of a consensus exist. What scope is there for movement?

Over the U.S. budget there is a major question mark concerning the attitude of President Mitterrand. Since the last devaluation of the franc within the European Monetary System the French have been more inclined to see the threat in high real dollar interest rates than the export opportunity that an overvalued dollar provides. Hence their recent criticisms of the level of the dollar and of lax American fiscal policy.

Attacking the Americans is, however, the traditional resort of a French President confronting a discontented populace. While President Mitterrand may feel that the unstructured approach at Williamsburg contains an implicit reproach in relation to French handling of Versailles, it would be surprising if he saw the disruption of the summit as being in French interests.

Nor is he totally isolated. The British, Germans and Japanese share French concern at the imbalance between U.S. monetary and fiscal policy and feel they have made some headway with the Americans on the issue.

Between now and the next Presidential election in 18 months time budget cuts are politically impossible. But President Reagan should have no difficulty in putting his name to a commitment to make cuts in the so-called "out years" beyond that date and some reference to lower interest rates must surely feature.

The summit leaders may also give a push to the process of multilateral surveillance initiated at Versailles, which is bearing more fruit than might have been expected. At a meeting last month IMF managing director M Jacques de Larosiere presented a paper which was conspicuously tough about the U.S. budget; the French were given a clean bill of health after their recent return to fiscal rectitude. More regular gatherings seem likely.

Even on exchange rates the outlook is not hopelessly bleak. Arguments about the pros and cons of intervention in exchange markets are probably less important than overall perceptions. And there is a growing recognition that stability should be an objective of policy. Where the links between exchange rates and monetary policy are concerned, it is widely agreed that money supply targetry sends poor or inadequate signals in a financially interdependent world.

There is less of a consensus on what to replace it with; and influential voices in the U.S. Administration, and also in the West German Bundesbank, remain reluctant to downgrade the importance of money supply targets. The OECD Secretariat's recent proposal for the use of money GDP targets commands interest, but not full support.

Unlike finance ministers, however, heads of government are not closely identified with specific methods of targeting. If they wished, and if they had the imagination, they could call for a study of different approaches to financial targetry. Similarly, they could bypass sterile arguments about exchange rate intervention and call for studies of different methods of exchange rate stabilisation as a preliminary step towards the new Bretton Woods conference that President Mitterrand has proposed.

On direct trade issues there is a general expectation that the summit could result in a call for more ministerial meetings of the GATT. The Americans have also been pressing for more specific institutional links between trade and financial issues. But the French are hostile to this initiative. And the whole area of trade policy is littered with banana skins for summiteers, because of their own recent bad behaviour on issues ranging from East-West economic relations, to European imports of video cassette recorders to Japanese restrictions on agricultural imports.

The achievements of a summit lie as much in the damage it prevents as in the specific measures it sets in train. If the outcome of Williamsburg, however low key, makes it even modestly less likely that high real interest rates and currency instability persist; that France, with its back to the wall, takes a quantum unilateral leap towards protection; that Japanese relations with the Western summit countries are permanently impaired; that the U.S. remains unconcerned at the international implications of domestic policy; and that LDCs move closer to default and despair, it will have been worthwhile.

It would be foolish to deny the scope for trouble, even with specific problems on exchange rates, East-West trade and the rest pushed out to the margins of the meeting. Much, in such an informal gathering, will depend on the chairmanship of President Reagan. The onus is on him to prove to the officials and sceptics who seem to believe that he couldn't run a Tupperware party that he is made of sterner stuff.

Simpler fares for London Transport

IT IS MORE than a year since the Greater London Council's Fares Fair scheme for a cheaper and simpler system of urban transport charges was killed off by an unsympathetic interpretation by the Law Lords of a badly drafted piece of 1960s transport legislation.

The deleterious effects of that ruling have been daily evident throughout the capital: exceptionally high fares, forced by the judiciary onto a GLC elected with cheap fares as the mainstay of its manifesto, have driven tens of thousands of travellers off the buses and the underground into private cars. Buses lost 16 per cent of their passengers, the underground lost 12 per cent; simultaneously the inner and outer areas of the capital became choked with cars and already difficult parking conditions became impossible.

Losers

Today the GLC is having another, rather more carefully prepared attempt. Fares will fall on average by 25 per cent. Most importantly, a travel card is introduced for the logical and simple zoning system and is valid for both buses and underground — a vital first step towards commuter fares integration.

Inevitably there will be a few losers—a few fares will go up, a few people will face the same or slightly higher costs without the benefit of an underground service. But the main principle of the system is to be welcomed: a simple exercise in comprehensible transport economics designed to attract passengers and alleviate a problem in need of a radical approach.

The Labour administration of the GLC has been its own worst enemy in presentation of a range of policies, many of which while of insignificance or no cost have proved offensive to a large number of ratepayers. Not surprisingly, the council may pay the ultimate price if the Conservatives are returned to power: it will be abolished.

But in the field of transport, at least, it has demonstrated a creditable attempt to make sense of London traffic today and an imaginative move towards sensible fare structures and levels.

The next logical step is to find a way through the maze of complexities surrounding British Rail fare structures so that eventually all commuter fares in the capital's suburban catchment can be sensibly integrated.

Commitment

This aim appears to lie partly behind the Conservative manifesto commitment to create a London Regional Transport Authority. But while the desirability of integrated fares is proven it is still far from clear that such an authority would be the best vehicle for implementing the policy. It is not clear from the manifesto what form the new body would take but the intention is apparently that it should be an appointed rather than elected board without the power to precept on ratepayers. If this means a super-quango appointed by and financed from the Transport Department there could be a serious diminution in accountability which would not be in the best interests of either taxpayer or farepayer.

Any new Transport Secretary of whatever political colour will face an immediate and urgent task on the whole subject of urban transport policy, not only for London but for all of Britain's metropolitan cities. It is a subject which for some reason attracts particularly mediocre, unimaginative and ambiguous legislation in this country. A mixture of flair and care is required and the latest GLC move appears to be showing the way forward.

Men & Matters

Kodak snaps

American businesses, acutely conscious of shareholder power and pressures, are becoming much tougher about the standards of service they require from professional advisers such as accountants and lawyers.

Yet Eastman Kodak has broken new ground in that direction by secretly investigating the law firm that acted for it for nearly 40 years—Donovan Leisure Newton and Irvine of Manhattan—and then confronting the firm with charges of malpractice.

In an out-of-court settlement that followed Donovan Leisure paid Kodak $675,000 and secured an agreement that the matter would not be given publicity.

While Kodak has observed the agreement by keeping mum for a year it has felt obliged, nevertheless, to answer questions if they are put by shareholders. So Fortune, the U.S. business magazine, recently bought 10 Kodak shares to secure the facts of the investigation and settlement.

The events began in the early 1970s when Berkey Photo, a New York photofinishing company, sued Kodak for monopolising the market for cameras, film, and developing equipment. Donovan Leisure led Kodak's defence. But it was discovered during the trial that Donovan Leisure had withheld material which Berkey had a right to see.

The jury awarded Berkey $113m damages from Kodak after the missing material was unearthed in the final days of the hearing.

Kodak fired Donovan Leisure. Later the case was settled on appeal by Kodak paying Berkey only $6.8m.

However, Kodak was extremely concerned that the public was in dobut whether Kodak had participated in its lawyers' misconduct. It hired an out-of-town law firm, Drinker Biddle and Reath of Philadelphia, to conduct an inquiry which took two years.

As a result of the investigation Donovan Leisure paid Kodak the $675,000 settlement a year ago.

Donovan Leisure has not lost its reputation as a law firm because of the affair. It still represents such major companies as Mobil, Walt Disney Productions, and American Cyanamid.

But on both sides of the Atlantic the affair is being seen as a pointer towards a growing disinclination by companies to let their professional advisers' mistakes go by default.

As I mentioned the other day, the Law Society representing British solicitors is raising the cost of its professional indemnity scheme for providing insurance cover by 15 per cent in the autumn. Its decision has been influenced by eight claims for more than £1m each which are in the pipeline against members.

In America roughly 5 per cent of the lawyers are now facing malpractice claims each year — although it should be said that the rate is much lower in the highest echelons of the bar there.

Paid up

Any motor industry magnate who drives up today to the elegant forecourt of Forbes House, the Belgravia headquarters of the Society of Motor Manufacturers and Traders, and expects to park will be out of luck.

All the places will be occupied by just one car—an all-British product so long that by comparison even a Rolls-Royce rates as a Mini.

The SMMT is giving its imprimatur of approval for London businessman Richard Noble's world land speed record endeavours by hosting the launch of his third attempt, which will be made later this year.

For Noble and his team of 30 it is intended that 1983 will mean third time lucky as the car's Rolls-Royce Avon jet engine (with reheat) is opened up on a dried lake bed in the Black Rock desert, Nevada.

In 1981 and 1982 his efforts to bring back to Britain the world land speed record which Donald Campbell lost to the Americans in 1964 were bedevilled by the weather.

The team was flooded out on the Bonneville salt flats in 1981 by a "once-in-a-century" rainstorm—as the locals called it. Last year, however, the same flats were hit again by floods so deep that Noble went swimming.

He moved on to the Black Rock desert and reached 615 mph—the record is 622 mph—before he was once again driven off by rain.

Now the sponsors and some 200 other companies which have contributed to the £1.25m project believe this will be their lucky year. For a welcome change with this type of project Noble and his team do not need to spend more time fund-raising. The sponsors have stood by him after the previous adversities. And the Project Thrust Team itself took the precaution of underwriting against St Swithin's Curse in 1982—thus securing a handsome pot of money for this year's attempt.

Big charge

In America the Energy Daily has tracked down what it believes is the biggest battery in the world.

A joint public sector-private sector venture called the Battery Energy Storage Facility (BEST) was opened just over a year ago in New Jersey to try to crack the problem of storing commercial quantities of electricity for use in peak-load periods.

Now BEST has a 1.8 megawatt hour lead acid battery which is running — all 674 separate battery cells of it — in its own building. Without such pampering as air conditioning or heating the battery is reported to be working reliably. It takes in mains electricity at night and is discharged during the day-time over a five-hour period. Its direct current output is converted back into mains electricity.

BEST is going ahead with work on other battery systems — zinc-chloride, zinc-bromide, and sodium-sulphur — and Al Pivec, the programme manager, is forecasting that large-scale industrial electricity storage using batteries will be in use as early as 1990.

Pirate post

No parts of the islands of Jersey and Guernsey are more than a few miles drive from the respective airports. But the Lilliputian scale of Channel Islands geography is not stopping the islands' postal services from insisting upon full delivery and collection rights for all mail.

Unlike the British Post Office the independent Jersey and Guernsey administrations still have monopolies for the carriage of mail.

The Jersey Post Office has now enlisted the aid of local customs officers to spot packages being brought into the island by private courier services, or taken to the airport for dispatch.

Any air-freighted package ought to be stamped with the correct postage to convey it between the airport and the local address. Otherwise the postal monopoly is being infringed.

Observer

VENTURE CAPITAL IN BRITAIN

The high-tech money bonanza

By Tim Dickson

RICHARD CROWN was a hot property in the City of London last month.

When word got around that his tiny business WordNet needed new funds for development, no fewer than 15 possible backers apparently stepped forward, chequebooks at the ready. The object of their interest—a small device which links typewriters to word processors—had chalked up impressive sales in its first few months of production but further progress was being hampered by a lack of adequate working capital.

Beseiged by offers on all sides Mr Crown opted to accept £250,000 from a relatively unknown investment company Yelverton Investments—in exchange for 25 per cent of his shares in WordNet. A measure of the interest is that at least two fund managers admitted later being bitterly disappointed that they had not landed the deal. And a measure of the range of terms offered is that one thought be stood a sporting chance demanding the same equity stake for exactly half as much money.

Such a story vividly illustrates the City's current passion for unquoted investments and its headlong dive over the last couple of years into "venture capital." Dozens of specialist funds are now touting for business, merchant banks and certain investment trusts have stepped up their profile in the search for high flyers, government agencies abound with "risk" money if you know where to look for it, and even banks, insurance companies and pension funds are occasionally throwing their traditional caution to the wind.

The competition for good investments is intense and those individuals with an exciting business plan and a dash of salesmanship are certainly making the most of it.

Yet while the private sector's record in backing small companies has greatly improved, gaps in the market remain and important lessons still have to be learnt.

● City institutions, for example, are still largely obsessed with the company which can show some sort of track record, requires between £100,000 and £1m, and enjoys above-average prospects (preferably based on a high technology product).

● Genuine start-ups as a result are generally shunned and the supply of funds for experimental research and development projects is even more inadequate.

● Even those established companies which cannot project dramatic earnings growth continue to have trouble finding support.

● The UK, moreover, is at a relatively early — and some would say confused—stage in adopting the techniques and style of American venture capatalists.

Sometimes rather inelegently called the "hands on" or "proactive" approach, the American influenced style of venture capital is distinguished by a high degree of involvement with the companies being backed, often to the extent of hiring managers, providing technical knowhow and above all supplying marketing skills.

Venture Capital Journal, the bible of American venture capitalists, reckons that perhaps \$5.5bn has been invested in this way over the last five years in the United States and that, spurred by a reduction in capital gains tax in 1978 and the increasing use of new issue markets (which allow venture capitalists to cash in on their success) the pace has quickened in the last couple of years.

Details of the fortunes made by early investors in computer companies such as Apple and Tandem are now well known—Kleiner, Perkins, Caufield and Byers, the lead investor, achieved a 100 to 1 return in Tandem. But it was when stories such as these first began filtering across the Atlantic that those in Europe were encouraged to believe that similar results could be achieved here.

By contrast to the 300 to 400 independent venture capital firms in the United States—each typically with perhaps a couple of technically qualified partners as well as financial specialists—genuine venture capitalists in the UK are still few and far between.

Technical Development Capital (TDC), part of the Finance for Industry Group (FFI) is certainly one. "We're geared up to put in at least 30 man days per year on each client," explains Geoff Taylor, general manager, who supervises a portfolio of 22 companies. "At the outset we probably spend a lot more time."

Ronald Cohen, managing director of the £10m APA Venture Capital Fund, agrees. He and his colleagues have just spent much of the last six months building a management team to run its latest computer software investment.

Perhaps the biggest force in the market is Advent Management, with some £20m of institutional money under its control in Advent Technology and Advent Eurofund.

David Cooksey, Advent's managing director, explains that his colleague Michael Moran has been despatched to California for a while to run a new San Diego subsidiary of Leeds-based Filtronics. "That's hands on if ever it was," Mr Cooksey said.

Most British and Continental institutional fund managers, on the other hand, are still characterised by the "win some, lose some" philosophy. This approach has long typified the UK merchant banks, which have tended to take the view that while a couple of companies in a portfolio of 10 may go bust and six may survive without doing anything spectacular (the "walking dead" in venture capital jargon) the dramatic performance of the other two will make the whole exercise worthwhile.

Some observers worry above all that enthusiasm for potentially lucrative unquoted investments has attracted fund managers with little experience of backing new companies and little understanding of the risks involved.

Geoff Taylor at TDC believes that "the pendulum has probably swung too far" and that "there is bound to be a shake out in a couple of years' time when certain operators realise the extent of the risk."

Norwich Union's recent annual report underlined some of these risks. It disclosed that Castle Finance, the company's risk capital subsidiary, lost money last year. Gavin Mills, chief investment manager, confirms the group has already written off £1m in a portfolio which has £4m invested in 26 companies.

But he says the risks can be over emphasised. "We are well aware that you have to have strong nerves. Before we set up Castle we had, over the years, invested £7m in 42 unquoted companies. These are now worth £16m-£17m. This proves you have to be patient."

In the U.S. venture capital funds have also developed strong nerves. But there too "there are venture capitalists chasing awfully hard to get money invested" said Gordon Moore, chairman and chief executive of Intel, in a recent interview. "I believe they are supporting a lot of things that don't deserve support."

But risk assessment is not the only problem, particularly in Britain. "There is still a far from perfect match between money and investments," says David Beattie, managing director of Grosvenor Development Capital, originally a spin off from the old National Enterprise Board, but now an independent development capital outfit.

A former industrialist whose £10m fund has committed just over £5m to 10 companies, Mr Beattie adds, "The very big deals of £7m or £8m are sometimes difficult to back whilst start-ups require a special sort of expertise." And too much of the available money is directed at the glamorous, but relatively small high-technology section of the market.

The Unlisted Securities Market (USM), where shares of some fledgling companies have soared to dizzy heights, has greatly accelerated this trend. Many fund managers want a quick ride of perhaps three or four years before they sell out at a profit.

This ready supply of money is not making life any easier for venture capital funds. Where once they could expect companies to come to them, now managers are increasingly finding that they have to take the initiative.

Increased specialisation, says Tony Lorenz, managing director of Equity Capital For Industry and vice-chairman of the British Venture Capital Association, can be one answer for funds. "Too many funds launched recently have too diffuse a purpose. Those that have a fine focus—towards any particular areas of high technology—are known in the market place and are still seeing a steady flow of sensible propositions."

But the largest and most experienced provider of long-term loan and equity finance for smaller companies, Industrial and Commercial Finance, Corporation (ICFC) insists that it is holding its own against the competition. Its continued success owes much to sound marketing—a branch network, links with financial advisers and referrals from existing customers — but also to a greater readiness than most to back sound companies start ups and not necessarily the go-go stocks of tomorrow.

Two gaps, however, remain. First sound companies whose capital base has been eroded over the years — by inflation or the recession — still find money hard to come by. The proposed Business Expansion Scheme, which allows individuals to claim tax relief on investments up to £40,000 a year in a wide range of established trading companies, is expected to help here.

The other major gap is for research and development projects. "The big problem area is between university research grants and start up money" says David Cooksey of Advent. "This is where the British Technology Group and the Government should in my opinion concentrate its main efforts."

It is estimated that in the U.S. perhaps half the venture capital money goes to early stage ventures where it is used primarily for product development. In addition research and development partnerships, which offer attractive tax advantages, are widely used but in the UK they are virtually unknown.

A major task for the next British Government it therefore likely to be to divert funds to this important sector of the market.

Lombard

Why share prices matter

By Richard Lambert in New York

THREE CHEERS for the great bull market. At best, politicians tend to look on a steep rise in share prices as a mark of confidence in the wisdom of their policies — welcome, but not too relevant. At worst, they regard such an increase as a conspiracy by a handful of heartless speculators, who are profiting at the expense of the great mass of the public.

In reality, however, a bull market is capable of making a direct and significant contribution to the national well being. The most obvious reason stems from the impact of a rise in share prices on the finances of individual citizens. It has been calculated that the value of consumer held stocks, bonds and liquid assets in the U.S. rose by more than \$500bn (£321.5bn) in the second half of 1982, thanks to the explosive performance of Wall Street. Over time, this extra wealth will be translated into a measurable increase in consumer outlays.

More significantly a bull market also increases both the willingness of companies to invest in new plant and equipment, and their ability to do so. During the 1970s, the price of just about everything rose steeply — except for equities. A share in AT and T was worth 120 packets of cigarettes in 1970—and just 81 packets in 1980.

As a result, the market value of U.S. corporations fell from well over 100 per cent of their net worth in the late 1960s to under 50 per cent in 1979. And since it didn't seem to make much sense to invest a dollar of cash into an asset that would immediately be valued at 50 cents, companies tended to pare back their capital spending.

So long as it was cheaper to acquire a factory by buying an existing business than by building on a greenfield site, takeovers flourished at the expense of new capital investment.

This paper shuffling has enriched some stockholders, but made little contribution to the overall economy. The bull market will make new investment even more attractive to companies and make it cheaper to accomplish. This is because in both the UK and the U.S. equity is by far the biggest and most expensive component of the overall cost of capital.

A new study produced in the U.S. shows just how far the high cost of capital has handicapped American industry in the past decade: the message would apply just as strongly in the UK context.

In this analysis, the cost of equity is defined as the rate at which expected future dividends (as perceived by a company's managers) must be discounted in order to arrive at a present value equal to the stock market valuation of the company's shares. In other words, if a company wishes to issue equity to finance a project, it can't just work out the cost of the present dividend: it must also take into account the impact of dividend increases in the future.

Calculated in this way, the real cost of equity after tax in the U.S. jumped from around 6 per cent to 10 per cent as a result of the bear market of the mid-1970s.

During the past ten years, the analysis concludes that the cost of capital in the U.S. has been more than three times that prevailing in Japan — largely because debt financing makes up a much larger proportion of company balance sheets in Japan than in the U.S.

Whereas in 1981, a U.S. manufacturer would have spent \$6,700 for labour and \$3,300 for capital for a given amount of additional output, the study says that a Japanese manufacturer would have had to pay only \$3,900 and \$1,000 respectively for the same output.

The precise figurework may be open to debate, but there is no escaping the sheer scale of Japan's capital cost advantages. Every point on the Dow makes the comparisons look less daunting — so let the bull market roll, and let's hear it for the FT 1000.

High cost of Capital: Handicap of American Industry. By Dr George Hatsopoulos. A study produced by the American Business Conference and Thermo Electron Corporation. Available from Thermo Electron, Attention Ms Delia Mitchell, 105 Bishopsgate, London, EC2.

Letters to the Editor

Points of international comparison on employment

From Mr M. Wolf

Sir, — It appears (May 17) that Mr Healey has argued that "Norway, Sweden, Austria and Japan had kept practically full employment right through the recession of the past 10 years by following the sort of policies proposed by Labour."

Mr Healey is perfectly correct that one or two points of comparison can be found between the policies followed by these countries and Labour's proposals (in part because Labour has so many propsals) although the differences between, for example, the anti-business policies and conservative attitudes to economic change of the Labour Party and the polices and attitudes of the Japanese government are, I would have thought, more striking than the similarities. Mr Healey could, however, have pointed to more interesting comparisons, even among industrial countries, for example, to the expansionary fiscal policies of France under M Mitterand or of the U.S. under Mr Reagan, neither of which has yet proved to be an outstanding success.

Such single points of comparison are irrelevant. It is rather the combination of policies that matter, but, on this, comparison is more difficult. The Labour Party's proposals for protection (including import controls), nationalisation, expanded government consumption and investment expenditure, rising government borrowing, expansionary monetary policies and extensive government control over private economic activity fortunately find no parallels, among major industrial countries, in the past 30 years.

For that combination one must turn to developing countries, where parallels are much easier to find. They include such economic disasters as Peron's Argentina, Allende's Chile, Manley's Jamaica, Ecevit's Turkey and Lopez Portillo's Mexico (and this is very far from an exhaustive list). It would be ironic if, promptly after the Falklands war, Britain were to follow the policies that started Argentina on the road to its present unhappy state.

Martin Wolf.
38, Peckarmans Wood, SE26.

Looking for staff

From the Managing Director, Securon (Amersham).

Sir, — As a relatively small company in Winchmore Hill, just between Amersham and High Wycombe, we employ at the moment some 100 people and are fortunate enough to have orders but find it very difficult to engage staff.

We use the Careers Office, which tells us there just aren't any about, we use the Job Centres, who tell us that the only people they have on their books are the ones who don't want to work, and in response to advertisements for secretaries, inspectors and the like, we get two or three applications.

We would point out that we are not looking for a bonus to employ people on the Youth Opportunities Scheme at £25 a week, but people working for us, providing they work reasonably hard, earn £80-£120 per week.

R. A. Proctor.
Securon, Winchmore Hill, Nr Amersham, Bucks.

Dioxin and orders of toxicity

From Mr J. David

The hunt for the 41 barrels containing dioxin waste is an illustration of the political importance of dioxin. If it is true that one-millionth of a gram of dioxin per kilogram of bodyweight would swiftly kill a human being, and nobody knows because dioxin has never yet killed anybody, it is still true that the 200 grams diluted to 2 tonnes has been diluted 10,000 times and this would give a fatal dose of 10 milligrammes per kilogram of bodyweight which is at least in the order of toxicity of many quite familiar substances.

The European chemical industry moves some 3m tonnes of dangerous and toxic waste across borders in Europe in the course of a normal working year and many tens of times that quantity will be disposed of safely within national borders. The industry works consistently to improve its safety record but it can only do so on the basis of objective tests

To add to all the problems generated by the political interest in dioxin has been the "Hooverisation" of the very name. In fact the very hazardous chemical generated at Seveso was a specific isomer of tetrachlor-p-benz-dioxin. This is formed when certain asymetric chlorinated phenols react. Virtually all phenols, however, are capable of forming dioxins and it must be one of the largest family of chemicals hitherto unrecorded simply because they only appear as impurities of phenols, many of which are important industrial raw materials.

If the term dioxin is extended beyond the specific isomer then products widely used in disinfectants, antiseptics, preservatives, adhesives and detergents, can all be said to contain dioxins. A ban on phenol based chemicals would be a backlash of imposing severity and immense economic effect. Similarly, if manufacturers of industrial chemicals are called upon to maintain standards of purity which have been required for materials which might possibly contain TCDD, ie parts per billion, then the costs of manufacture of many of industry's basic materials would increase to unacceptable levels.

In all this perhaps it is advisable to remember that even the Seveso dioxin has never caused a fatal accident and where it has been possible to study its effects on humans objectively and scientifically, whether at Seveso or at other factory accident sites, including one in the UK, none of the long term effects feared have been found. The most severe result has been chloracne, a skin condition which improves on treatment, and which, incidentally, is not a disease; any respectable virus holds far more destructive potential in a single cell than all the dioxins ever made.

J. David,
1, Coneydale, Welwyn Garden City, Herts.

Nobody wants to lose

From Mr R. Musgrave

Sir,—According to your article on Comecon multinationals (May 18) the latter do not think they should be likened to Western multinationals because the Eastern variety are guided by "state goals rather than private profit." This is misleading because the state's goal normally is to make a profit.

Of course the idealistic revolutionaries in Russia 50 years ago thought profit an undesirable objective. But nowadays most firms in Comecon are expected to produce a return on capital just as in the West. Furthermore, countries desperately short of Western currency are hardly likely to set up operations in the West that aim to lose hard currency.

R. S. Musgrave.
24, Garden Avenue, Framwellgate Moor, Durham.

Steel demand and Ravenscraig

From the Director and Secretary, British Iron and Steel Consumers' Council

Sir,—Dr Jeremy Bray asserts (May 16) that I present a scenario of savage deflation etc as being the limit of what can be expected in terms of future steel demand. In fact I only pointed out that Cambridge Econometrics' highest forecast still left a margin of 5m tonnes excess capacity in the UK, roughly three times Ravenscraig's capacity. About half that excess would be in strip mills, which answers Dr Bray's assertion that I ignored the question of product mix.

I must also admit, after 15 years' experience of forecasting in the engineering industry, to a certain scepticism about politicians' forecasts based on assumptions of sharply increased future economic growth.

In a short letter there was also no space to deal with quality issues to which Dr Bray also refers. He is clearly unaware that for many years my council has pressed British Steel Corporation and the Government to maintain quality improving and cost reducing investment, e.g. in continuous casting. That is vital to BSC's competitiveness and that of its potential customers. We are assured that it is BSC's intention to maintain such investment, e.g. at the remaining strip mills. If BSC, or taxpayers (through the Government) are unable or unwilling to afford this investment because the U.S. deal falls through and surplus capacity is retained at Ravenscraig at great cost, the consequences for competitiveness, and so jobs, in steel and the steel using industries will be serious indeed.

Dr Bray writes that BSC's strip mills "have now been asked to produce at their full capacity up to August." It is a pity that he did not make it clear that this referred to manned capacity" which is only two-thirds of "plant capacity."

I will not repeat the arguments in favour of the U.S. deal (my letter of May 10). One of its advantages would be to make the jobs of more than half those currently employed at Ravenscraig, and some in Wales, no longer a burden on the taxpayer. The money saved could then be invested in infrastructure projects in areas particularly hard hit by unemployment, thereby creating more "real" jobs, not least in the steel and steel using industries.

J. F. Safford.
16, Berwyn Road, Richmond, Surrey.

FINANCIAL TIMES
Monday May 23 1983

Terry Byland on Wall Street

Dangers of rising M-1 sink in

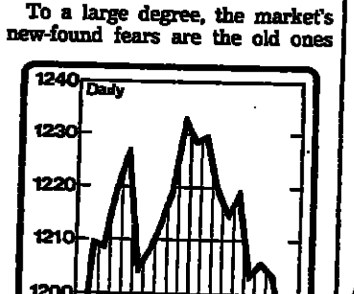
SHARE MARKETS in the U.S. have been slow to respond to a shift in investment attitudes after the renewed rise in M-1 money supply, which has already stopped the bond market in its tracks. But equities analysts at the leading brokerage houses are now beginning to sound a more cautious note and this week will bring a general updating of the investment advice offered to important clients.

The new mood of uncertainty, which brought some sudden setbacks for share prices last week, differs in kind as well as in degree from the warnings of a pending "correction phase" to be heard up and down Manhattan a month or so ago.

The merchants of the correction-phase theory were left looking foolish more than once last month when the market brushed aside the profit takers and soared to new peaks.

This time, however, the warnings are being voiced more seriously and are finding more sensitive nerves in the market.

To a large degree, the market's new-found fears are the old ones



brought up to date with more convincing statistics. The difference is that the market is taking the worries more seriously this time round.

The increase in M-1 money supply, now that the strength of the economic recovery is clearly established, has added teeth to the fears that interest-rate trends – and the Federal Reserve's credit policies – may be coming under pressure.

A trip round the analysts last week suggested that the debate over interest rates has moved smartly out of the relatively academic climate of last February and into the equity market place.

As recently as two weeks ago, the equity market was only too willing to see the rise in M-1 as, hopefully, a correction to distorted totals in April, and share prices held firm despite some nervousness in the bond market.

But the equity market has undergone a somewhat belated conversion to the views summed up by Mr Peter Canelo, portfolio strategist at Merrill, Lynch, Pierce, Fenner and Smith.

"The money numbers are not going to go down, they are going to go up," he commented bluntly last week. The Federal Reserve Board may be able to keep short-term rates steady but the writing is on the wall at the longer end of the bond market, where prices have already fallen sharply.

On the other side of the equation, the strength of the economic recovery in U.S. business is now well established and last week's disclosure of a sharp rise in personal incomes has been noted as perhaps the first hint that inflation might not yet be completely licked.

Putting all those trends together, the brokerage analysts are now advising their clients to reshuffle their portfolios to protect themselves in the event of a tightening of credit later this summer.

Mr Alan Schwartz, director of research at Bear Stearns, advises a shortening of maturities in bond portfolios, accompanied by selective selling of equities, "to raise cash to go back into the market later."

The message was repeated by other brokerage houses. Most at risk are likely to be the smaller, high-technology stocks which stood out in the early days of the market advance. Many of these companies would find it hard to raise money if credit conditions tightened, and the share prices have recorded gains beyond credibility

Bullishness for the longer term remains unimpaired – the leading industrial companies will be showing substantially improved results in the third and fourth quarters of this year, as the economic recovery works through the system. Mainframe computer makers, defence stocks and financial-services issues are all recommended as safe havens during any period of market shakeout.

The next six weeks should prove an interesting time for Wall Street. As long as fears of tighter credit conditions prevail, the equity market will remain nervous. But if the days of easy share profits are over for a time, the winners will as usual be those who saw the writing on the wall first.

Bonn 'failing to protect German steel industry'

BY JAMES BUCHAN IN BONN

A LEADING West German steelmaker sharply attacked successive Bonn governments for failing to protect the battered German industry from subsidised European competition, and raised the prospect of compensatory border tariffs against subsidised steel imports.

Dr Dieter Spethmann, chief executive of Thyssen, Europe's largest private steel concern, and chairman of the West German producers' federation, accused Bonn of "even today still failing to understand properly" the problem of subsidies, above all in the UK, France, Italy and Belgium which he said, had amounted to a cumulative DM 80bn ($32.5bn) since 1975.

"No private concern can survive in competition with the united finance ministers of Europe," Dr Spethmann said in an interview with the Hamburg magazine Der Spiegel at the weekend.

While Dr Spethmann poured most of his scorn on the former Social Democrat-liberal government, he left no doubt that he included Chancellor Helmut Kohl's new centre-right government in the charge that Bonn has "no steel policy at all." Count Otto Lambsdorff, the economics minister and thus re-

Dr Dieter Spethmann: 'failure to understand'

sponsible for steel, has kept his post through both administrations.

However, Dr Spethmann did say that he was convinced that West German representatives would show greater "backbone" in getting subsidies dismantled. Ironically, the German steel industry led by Thyssen is demanding billions of D-Marks from Bonn – and approval from Brussels – to push through cuts in capacity to meet the steel crisis.

Dr Spethmann also repeated his proposal, first outlined in a letter to Chancellor Kohl last autumn, for border protection against subsidised imports.

"Why should we be left exposed to illegal practice in Europe, when the U.S., for example, knows how to defend itself?" he said, referring to the imposition of compensatory import tariffs in the U.S. last year which led to a transatlantic squabble.

Dr Spethmann also sharply criticised the Klöckner-Werke concern, which was expelled from the federation he has headed since 1974 for exceeding European Community crisis production ceilings. Klöckner is refusing to pay fines imposed by the European Commission, which could amount to DM 200m.

Underlining Klöckner's all but complete isolation in the troubled West-German steel community, Dr Spethmann said that its "overproduction" had cost the other concerns billions of D-Marks. "Brussels and Bonn must take drastic measures," he said.

Businessmen aim to restore British links with Malaysia

BY CHRISTIAN TYLER, TRADE EDITOR, IN LONDON

A HIGH-LEVEL British trade mission to Malaysia is being organised to mark the formal end last month of business hostilities.

Senior industrialists and bankers chosen by the British Overseas Trade Board (BTOB) will visit Kuala Lumpur in October. The visit will take place almost exactly two years from the day when "buy British last" policy was decreed Dr Mahathir Mohamed, the Malaysian Prime Minister.

The provisional list of visitors includes the chairmen, or senior executives of Thorn, Rolls-Royce, Rank Xerox, Metal Box, Scicon, Lloyds Bank International and the Commonwealth Finance Corporation. They will be led by Lord Jellicoe, former chairman of Tate & Lyle and now chairman of the BOTB.

Investment as well as trade will be on the party's agenda. Mr Christopher Roberts, chief executive of the BOTB, said: "We hope that it will set the seal on the restoration of normal good relations with Malaysia."

Dr Mahathir announced early last month that in future British goods would again be treated on the same basis as those of their competitors.

That followed his meeting with Mrs Margaret Thatcher, the UK Prime Minister, in London and a UK Government decision to raise by £46m ($71.8m) over three years the amount of scholarship money for foreign students at British universities – of whom many are Malaysian.

The Malaysian Prime Minister had announced his edict while a previous British trade mission was in Kuala Lumpur in October 1981. Among the reasons he gave was that British officials and businessmen had shown a patronising attitude and lack of sensitivity to the Malaysian policy of securing 30 per cent national ownership of the country's assets.

He also complained about new London Stock Exchange rules after a Malaysian state company's takeover of Britain's Guthrie Corporation, and the cut in scholarship grants.

Despite the decree, Britain's exports to Malaysia showed an increase last year. Worth £224m in 1980, they fell to £196m in 1981 but rose to £221m last year. However, businessmen estimate that many millions of pounds worth of contracts may have been lost while the special scrutiny was in force.

A fall in the sterling exchange rate helped to keep British goods on the market, and Dr Mahathir himself at one stage said the effect of the edict had been "very, very minimal."

World Trade News, Pages 3, 4

UK makes late bid for robot market

BY PETER BRUCE IN LONDON

FOUR British companies, Lansing Bagnall, Babcock FATA, Fenamec and Dexion, are in competition to put the first domestically manufactured automated guided vehicle (AGV) on the market before the end of the year.

AGVs, slow-moving platforms guided by under-floor wires, are used widely in the rest of Europe, especially Sweden, France, West Germany and Italy, in manufacturing plants and warehouses. The UK market is probably the most underdeveloped among the major European industrial countries.

The UK companies have, however, been encouraged to move into AGV production by British industry's new interest in flexible manufacturing systems, and by a sharp increase in the number of automated warehouses being ordered this year in the UK.

Manufacture of the AGV will mean that for the first time British industry will be able to source locally all the major hardware required for manufacturing or handling automation projects.

The AGV will complement an established machine tools industry, and growing investment in robotics and high-speed warehouse retrieval systems.

Although the Japanese, notably Komatsu, are in the AGV market, European manufacturers, such as Sweden's Tellus and BT groups, Schindler, which makes the Digitron AGV in Switzerland, and Wagner and Jungheinrich of West Germany, dominate. Mannesmann Demag, of West Germany, recently tightened the European grip on the industry by buying out the biggest U.S. manufacturer, Barrett Electronics.

Lansing Bagnall, Britain's biggest producer of forklift trucks, and Babcock FATA, a Babcock International subsidiary, are developing their own AGVs for the British market. Both Dexion and Fenamec, which manufactures conveyor systems and is part of the J. H. Fenner engineering group, are seeking manufacturing licences from foreign producers.

Lansing has already developed prototypes, and is likely to put a range of machines of varying degrees of sophistication on the market. The company is also collaborating with Warwick University on the development of a free-ranging AGV system which would dispense with wire guidance.

Babcock FATA hopes to have its first AGV on the market by July. The company plans to manufacture AGVs specifically for distribution roles in automated warehouses, an area in which it already has considerable experience.

Thatcher holds strong lead in opinion polls

Continued from Page 1

Conservative strategists will be hoping for no repetition of the open differences last week between Mrs Margaret Thatcher and Mr Francis Pym, the Foreign Secretary. Mrs Thatcher yesterday dismissed as "totally and utterly untrue" reports that Mr Pym had told her he would leave the Government if he was removed as Foreign Secretary after the election.

Mrs Thatcher said Mr Pym had no such conversation with her and "he is very distressed at that totally false report."

Our Belfast correspondent writes: The leaders of the two rival Unionist parties in Northern Ireland yesterday issued a joint statement warning constituency parties of the danger of Sinn Fein election victories if single Unionist candidates are not agreed.

The statement from the Rev Ian Paisley of the Democratic Unionists and Mr James Molyneaux of the Official Unionist Party appeared to be the closest they were likely to get to an election pact before nominations closed.

There are six key constituencies where a split Unionist vote would open the way for a Nationalist victory. Mr Paisley proposed that each party would fight three seats. Attempts to find agreement continued over the weekend.

World Weather

		°C	°F			°C	°F			°C	°F			°C	°F
Ajaccio	S	20	68	Dubrovnik	S	26	79	Malaga	S	22	72	Salzburg	C	13	55
Akrotiri	F	23	73	Faro	S	18	64	Malta	S	24	75	Seoul	–	—	—
Algiers	–	—	—	Florence	F	27	81	Manila	–	—	—	Singapore	T	31	88
Amsterdam	C	11	52	Frankfurt	S	14	57	Miami	–	—	—	Stockholm	F	17	63
Athens	S	27	81	Funchal	C	17	63	Milan	R	15	59	Strasbourg	C	14	57
Bahrain	S	35	93	Geneva	C	12	54	Moscow	S	23	73	Sydney	–	—	—
Bangkok	–	—	—	Gibraltar	S	21	70	Munich	C	10	50	Taipei	–	—	—
Barcelona	F	16	61	Guernsey	F	11	52	Nairobi	C	24	75	Tangier	F	17	63
Beirut	F	23	73	Helsinki	S	18	64	Naples	F	28	82	Tehran	–	—	—
Belgrade	F	30	86	H. Kong	F	28	82	New Delhi	S	28	82	Tel Aviv	S	26	79
Berlin	C	15	59	Innsbruck	R	13	55	New York	–	—	—	Tenerife	C	20	68
Biarritz	C	13	55	Inverness	C	9	48	Nice	S	19	66	Tokyo	C	27	81
Blackpool	R	8	46	Istanbul	F	19	66	Oporto	F	15	59	Toronto	–	—	—
Bordeaux	F	16	61	Jersey	R	9	48	Oslo	C	10	50	Tunis	C	24	75
Brussels	C	12	54	Jo'burg	S	13	55	Paris	S	13	55	Valencia	F	21	70
Budapest	–	—	—	Las Palmas	F	20	68	Prague	F	16	61	Venice	C	24	75
B. Aires	–	—	—	Lima	–	—	—	Reykjavik	S	8	46	Vienna	S	21	70
Cairo	F	30	86	Lisbon	F	16	61	Rio de J'o	–	—	—	Warsaw	S	24	75
Cape Town	F	17	63	Locarno	R	9	48	Rome	S	23	73	Zurich	R	8	46
Caracas	–	—	—	London	F	13	55								
Casablanca	F	18	64	Los Angeles	–	—	—								
Copenhagen	C	13	55	Luxembourg	C	13	55								
Corfu	S	27	81	Madrid	F	16	61								
Dublin	C	10	50	Majorca	R	10	50								

Readings at mid-day yesterday:

C–Cloudy D–Drizzle F–Fair Fg–Fog H–Hail R–Rain S–Sun Sl–Sleet Sn–Snow T–Thunder

Atlantic air talks to discuss pricing

By Michael Donne in London

FURTHER efforts will be made in talks starting today to improve Anglo-U.S. civil-aviation relationships, which are at their lowest level for many years.

Primarily, the talks, to be held in London, will be aimed at persuading the U.S. Justice Department to drop its planned anti-trust investigation into alleged price-fixing by British Airways and British Caledonian Airways (BCal) on the North Atlantic air route.

But other topics might also be raised. One is the U.S. Government's attitude to a separate legal action being taken in the U.S. by the liquidator of Laker Airways, alleging that British Airways and BCal conspired to drive Laker off the North Atlantic.

Another issue is whether the UK should license the new U.S. transatlantic operator, People Express, to fly a cheap-fare service between London Gatwick and New York (Newark, New Jersey).

The airline, approved by the U.S. Government, wants to start on Friday, and is already taking bookings. The UK Department of Trade, however, feels it is being pushed too fast and wants more time to review the airline's financial and other capabilities.

There is also a long-standing and increasing U.S. disenchantment with the overall scope of the Anglo-U.S. Bermuda Two air treaty, which U.S. airlines have for long claimed benefits British civil aviation at the expense of the U.S. – a claim the UK rejects.

There have been many suggestions in the U.S. air transport industry for a review of the treaty. It might be that that will prove the best way of clearing what is increasingly becoming a difficult area of Anglo-U.S. trade relations.

Either side can give one year's notice of the desire to end the treaty. The current difficulties surfaced several months ago, when the liquidator of Laker Airways decided to file a suit in the U.S. against BA and BCal, alleging conspiracy to drive Laker off the route by offering low fares that Laker could not match. The airlines deny the charge, and are defending the action vigorously in the U.S.

They have also tried to obtain a UK court ruling that the matter should be settled in Britain and not in the U.S., but that was rejected in the UK High Court last Friday by Mr Justice Parker. An appeal is to be made.

The U.S. Justice Department's interest in the North Atlantic air fares has been aroused, however, and it is making its own, separate investigation into the affair, to discover whether any "criminal" acts against the U.S. anti-trust laws have been committed.

If either the Laker liquidator's action or the Justice Department's investigation goes against the airlines, they could face heavy financial penalties in the U.S.

The airlines have denied both accusations. They have argued strongly that their actions are governed by a blanket immunity from U.S. anti-trust laws granted by U.S. acceptance of the fares, agreed within the International Air Transport Association, of which both airlines are members.

In addition, they claim that, where the UK is concerned, all Anglo-U.S. civil aviation matters are governed by Bermuda Two.

The ruling by Mr Justice Parker in the UK last Friday – pending appeal – may mean that the Laker liquidator's action is not covered by Bermuda Two, but the Department of Trade still firmly believes that the U.S. Justice Department's actions are covered by the treaty.

Moreover, the officials believe that while it may be possible for an individual to bring an action in the courts against the two airlines, the Justice Department itself, as an arm of the U.S. Government, is bound by the treaty.

The Justice Department does not agree, although there is believed to be some sympathy in other branches of the U.S. Government for the UK's position.

Nigeria debt progress

Continued from Page 1

so severe that such a refinancing should be undertaken only as part of a more comprehensive approach by international banks to the country's financial problems.

One U.S. banker involved in talks on Nigerian debt both in Europe and the U.S. said at the weekend that "substantial progress" had been made at the New York talks. He said the latest proposal reflected a major change of direction in the attempts to deal with Nigerian debt and was much closer to the U.S. bank's original position.

In return, the U.S. banks appear prepared to participate in the refinancing before any formal IMF programme is in place. Talks aimed at reaching agreement on an extended fund facility of up to $2.6bn have begun, following a formal approach by Nigeria.

The Nigerian talks are proving to be among the most complex of the series of country reschedulings now under way. One of the main problems has been a lack of accurate information about the size of the arrears.

U.S. banks have been concerned that discussions of solutions to the arrears problem has concentrated in European banks. These have longer experience of Nigeria

THE LEX COLUMN

A long haul for cable

The White Paper on cabling Britain, released last month, leant over backwards to meet the requirements of the business cable lobby. Yet after the initial enthusiasm last year, when cable consortiums were being formed on what seemed to be a weekly basis, the atmosphere has turned rather flat.

In large measure this reflects the evaporation of euphoria wafting over from the U.S., where the new generation of cable companies have found the going extremely tough. Nevertheless, behind the scenes, several companies with large resources remain committed to gaining a foothold in the new medium, and there are likely to be around 20 very serious applications for the 10 or 12 pilot projects mooted in the White Paper.

The commitment persists in spite of the widespread recognition that the pay-off for investment in cable will be very long-term as well as risky. The initial capital expenditure – involved in putting in the cable networks – is high, while revenue builds up slowly. It will take some years to push up to the necessary penetration of households, then later on still the income stream is boosted as additional services, such as data communications, are added to the base load.

At this stage two types of operator seem to be interested in establishing a presence; large companies which want to run and instal their own cable systems, and smaller operators interested in leasing networks established by British Telecom (BT) and Mercury. The small operators have a major problem in securing finance in the build-up phase. In the early stages, the negative gap between income and the rental charged by BT could be wide. Yet without physical assets as a security, banks will probably be unwilling to advance loans to support the loss-making period. Once a system is mature, small-scale operators should be at no disadvantage. But it looks as if BT or Mercury will have to provide strong support for these players in the intermediate stage.

If Mercury and BT prove reluctant, large companies are likely to dominate the industry. Established heavyweights such as Rediffusion and Electronic Rentals are likely to be joined by the new entrants such as Granada and Ladbroke. These companies have their own taxable capacity, which means they can utilise 100 per cent capital allowances to the full when installing a cable base. By contrast, BT's capital expenditure already far exceeds its profits, so that in spite of its inbuilt advantage of having cable ducting already in place, its net capital costs may exceed that of some of the newcomers.

For large concerns, the 12-year franchise period still poses a problem. It allows an effective term of perhaps only seven or eight years for debt finance, which could be too short, given the long-term nature of the investment.

Meanwhile, estimates of the return on investment are unreliable. It is possible to make a stab at costs, but demand remains an unknown. However, it looks as if the level of the return will be highly geared to three main factors – penetration, the initial capital cost, and the price consumers are prepared to pay. The most recent studies suggest that the returns may lie in the 10 to 20 per cent range – which is not wildly compelling. On this basis, the Government may come under pressure to lengthen the franchise period to the 15-year minimum granted in the U.S.

Oil sector

The sight of Opec finally shaking itself back into some sort of pricing order, to say nothing of the UK Chancellor of the Exchequer waving a magic wand over North Sea oil taxes, has given the oil sector its first tonic since last summer. After badly lagging the market through the autumn, it has risen by 24 per cent since the beginning of the year, more-or-less regaining the ground lost against the FT All-Share index.

Nevertheless, a yield premium of 2 percentage points over the index, even allowing for the usual differential, underlines the uncertainties still hanging over the sector. Prices have to stand the test of a long summer of slack demand. The recently denied stories of Iran breaking ranks are a symptom of the edginess in the market as non-Opec production strengthens, notably in the North Sea.

The extent of the North Sea upswing was to some extent evident in last week's first-quarter figures from Shell, which generated most of its reported profits increase from its upstream activities. Shell was admittedly benefiting from the very high sterling price of oil, but it also gained strongly from the 118,000 barrels-a-day rise in production, mostly in the North Sea.

In the current quarter, North Sea production companies can again be expected to gain from higher production, although losing ground on the currency play – sterling's steady strengthening against the dollar will reduce their shelter against the cuts in dollar-denominated oil price. But the strength of production is itself a cause for concern, since it means that pressure on Opec sales could re-emerge.

Renewed jitters about Opec could in turn cast a shadow over the smaller North Sea exploration companies. The tax changes have only just made some of the figures on marginal oil fields add up satisfactorily; falling prices would unscramble all these sums. In this situation, the defensive qualities of the integrated majors look even more of a virtue. If oil prices again come under pressure, this might at least feed through into better downstream margins – whatever the stock losses.

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FINANCIAL TIMES
Monday May 23 1983

EUROBONDS

How an innovative deal can fall flat

BY MARY ANN SIEGHART

THE EUROBOND market is proud of its tradition of innovation. Warrants, partly-paid deals, zero coupon bonds – these are just some of the ways the market keeps its head above water during uncertain times.

Sometimes, however, the product of hours and hours of imaginative investment bank thinking is given hardly a nod by the market. If a deal is too complex the market may grumble rather than cheer. Witness the case of last week's new deal for Crédit d'Equipement des Petites et Moyennes Entreprises (CEPME) an innovative issue which got only an average reception.

Hill Samuel's new idea for CEPME was a fixed-rate Eurosterling bond, which is convertible into a dollar floating rate note. The 12-year, £30m bond carries a coupon of 11¼ per cent at par. During the first five years of its life, it can be converted into a dollar FRN paying the six-month London interbank offered rate (Libor).

At first glance, it appears ingenious. And from CEPME's point of view, it is relatively cheap. Investors are sacrificing about 70 basis points on the straight bond and 40 basis points on the floater for the sake of the currency conversion option.

Hill Samuel conceived the bond as a hedge against a weaker pound should the Labour Party win Britain's general election. But it also found that the issue attracted interest from dollar-based floating rate note investors who receive nearly two extra percentage points of yield on the straight bond and can convert to floaters if sterling weakens.

At first, the market was mystified by the deal, but the price picked up from a two-point discount against its issue price of par to just over one by the end of the week. While investors were starting to bite, though, the middle men were less enthusiastic. "Where do I trade it?" asked one dealer. "Is it a dollar bond? A sterling bond? Fixed-rate? Floating?"

Apart from trading difficulties, the bond is also difficult to value. One large fund manager explains: "If you're too innovative, you may frighten off some of the market who don't understand the deal. Even if you like it, it's not always easy to persuade your clients to buy it."

One new issue manager summed up the ambivalence many feel towards innovative deals: "What I would like to see is a plain vanilla straight bond correctly priced – that would be a real innovation in this market."

Elsewhere in the Eurodollar market, some $345m worth of bonds was launched last week, almost all of it on Wednesday when the six-month Eurodollar deposit rate fell from 9³⁄₁₆ to 9 per cent. Short-term dollar rates were higher last week than they have been for about a month.

Deposit rates in D-Marks and Swiss Francs also rose last week, which might explain the lacklustre atmosphere in those markets.

The dollar secondary market, however, held up surprisingly well last week in view of the poor performance of the New York bond market. The larger-than-expected M1 money supply figures from the week before last showing an increase of $4.2bn gave the New York market an attack of the jitters.

Prices in the Eurodollar market, though, fell only by about ¼ point on the week. One reason may be that Europeans are less bearish about interest rates, but what is more likely is that Continental investors are taking a view on currency movements rather than interest rates, and the dollar has recently been strong.

This week is likely to be quiet in both the primary and secondary dollar markets.

HONG KONG MAY TAP EUROMARKETS

Politics and credit risk

BY PETER MONTAGNON IN HONG KONG

THE HONG KONG Government has been dropping tantalising hints to the foreign banking community that it may need to borrow next year to cover its budget deficit.

Last year the Government ran a budget deficit of HK$3.5bn (U.S.$497m). This year, despite some sharp increases in indirect taxation, a further deficit of HK$3.4bn is projected. The deficits will be met by drawing on reserves built up by years of accumulated surplus, but by the end of the current fiscal year in March 1984, net fiscal reserves would be down to only about HK$8.6bn.

If the deficit continues into 1984, the government has indicated that it will resort to a "modest" amount of borrowing. No decision will, however, be made until later in the year when a clearer impression of this year's public accounts can be gleaned.

Nonetheless, the prospect of a rare borrower entering the Euromarkets has already caused considerable speculation in Hong Kong especially in view of the political question mark hanging over the colony's future – the British lease on the New Territories expires in 1997.

The debate also shows up yet again the wide disparity in credit risk assessment between the bond markets and the Eurocredit market.

In normal times Hong Kong might be considered an excellent candidate for the bond market because of its established record as an exporter and its long tradition of prudent fiscal management. The intrusion of the political problem appears to put all that out of the question. "You couldn't sell Hong Kong to a dentist in Bruges," said one banker.

On the other hand the rarity of the name and the presence of many foreign banks in Hong Kong means that the colony could get away with a very low margin on the syndicated credit market, especially if its borrowing was relatively short-term. Unlike dentists, bankers, it seems, would be only too glad to stand up and be counted in the case of Hong Kong.

They may not have to. Hong Kong could still decide that it does not need to borrow after all, or it may choose instead to borrow short-term Hong Kong dollars in the local money market. This will depend on whether its identified needs are foreign exchange costs or not – though one argument against local borrowing is that it could cause unwarranted upward pressure on Hong Kong interest rates.

Yet expectations in Hong Kong are such that there could even be a degree of disappointment among the foreign banking community if, having dropped the hint, Hong Kong decided not to borrow. "After all," says one interested banker, "nothing could do more to boost confidence in this place than a syndicated loan jointly led by the Hong Kong Bank and the Bank of China."

INTERNATIONAL CREDITS

Little progress on Brazil debt

BY MARGARET HUGHES IN LONDON

THE MAIN preoccupation of international bankers during the past week has been Brazil and Nigeria. Efforts to resolve the Brazilian problem and, in particular, the restoration of $1.5bn interbank lines, have been complicated by conflicting attitudes among leading Western central banks. While the U.S. Federal Reserve Board and the Bank of England have urged commercial banks to maintain interbank lines, several European central banks have been less insistent.

If there is no reversal of some commercial banks' refusal to restore interbank lines, the option of a new $1.5bn commercial bank loan becomes increasingly likely, together with a possible approach to the U.S. Treasury.

Brazil is already some $800m behind with its debt repayments and its liquidity crisis will be heightened by the possible delay of up to a month in the disbursement of the next tranche of the IMF's $4.9bn loan. As a result, delayed repayment of the $400m instalment of its $1.4bn BIS bridging loan due next month is also likely to be requested.

With the switch in venue from London to New York the Nigerian negotiations appear to have made progress, even if the situation has not been finally resolved. Broadening the talks beyond the refinancing of short-term trade arrears seems both more realistic and more in keeping with Nigeria's needs.

Nigeria has succeeded in doubling the maturity of the refinancing loan to three years, even though this still remains tied to the letters of credit involved. But the possibility of new money, which the Nigerians have wanted all along, has been considerably increased by the decision of the banks to establish a co-ordinating committee and economic sub-committee which will look at Nigeria's overall debt situation. The banks concerned point out that it has yet to be established whether any rescheduling is needed.

Today is crucial for Chile since it is the deadline by which commercial banks have to commit themselves to the package rescheduling $3.4bn of debt which falls due this year, new loans of $1.3bn and the restoration of some $200m in short-term trade credits.

Although Argentina appears to have met its first-quarter IMF targets – the IMF board will be meeting this week – and so will be able to draw down the second tranche of its $1.5bn IMF standby facility, it seems little nearer getting the proposed $1.5bn medium-term loan from commercial banks.

The Central Bank has still to announce new terms for refinancing the $4.6bn short-term private sector debt and the $1.4bn in swaps.

Meanwhile, lawyers for the banks' co-ordinating committee have had little success in attempts to get the bankruptcy laws changed to alter the position of foreign bank creditors of Cellulosa Argentina, whose $150m foreign debts are at present subordinate to those owed to domestic banks.

CURRENT INTERNATIONAL BOND ISSUES

Borrowers	Amount m.	Maturity	Av. life years	Coupon %	Price	Lead Manager	Offer yield %
U.S. DOLLARS							
Gt. Western Fin. Corpn. §‡	50	1998	15	7½	100	CSFB	7.500
Honda Motor §‡	100	1998	15	5¼	100	Nikko Secs., Nomura Intl.	5.250
Amedco §‡	20	1998	15	*	100	Morgan Grenfell, Shearson/Amex	7.500
EMCA §‡	20	1990	7	0	98½	Bque Gutzwiller Kurz Bungener	–
Sumitomo Bank ‡	100	1990	7	10⅞	99½	Salomon Bros., Sumitomo Fin., Citicorp., Goldman Sachs	10.981
Credit Chimique †‡	50	1990	7	5¼∅	100	Morgan Stanley	–
Pirelli ¶‡	40	1988	5	6¾	100	CSFB, SBCI	6.750
Sandoz §	50–60	1995	12½	5–5½	100	UBS Secs	*
Mtge. Bank of Denmark †‡	80	1990	7	5¼∅	100	Nomura Secs.	–
D-MARKS							
SATS	100	1990	7	8¼	*	BHF-Bank	*
Renault ‡	150	1990	7	8	100	Deutsche Bank	8.000
Asas ‡	100	1988	5	8¼	100	Bay. Vereinsbank	8.250
Air Canada ‡	100	1993	10	7⅜	99½	Deutsche Bank	7.448
Credit Foncier de France **‡	100	1991	8	8	100	Commerzbank	8.000
SWISS FRANCS							
Honda Motor §‡	100	1993	–	3½	100	UBS	3.500
Honda Motor §**‡	100	1988	–	3½	100	UBS	3.500
Maisei Ind. Co. **§‡	30	1988	–	3⅝	100	Banca del Gottardo	3.625
IADB ‡	100	1993	–	6⅛	100	CS	6.125
Ikegami Tsushinki **§‡	20	1988	–	3¾	100	Nomura (Switz)	3.750
Montreal Urban Cmty. ‡	100	1993	–	5¾	100	CS	5.750
Inveimer ‖	60	1991	–	6⅜	99½	Chase Manh. (Suisse)	6.457
Deutsche Bank **‡	150	1988	–	5⅛	100	SBC	5.125
Ushio **§	40	1989	–	*	100	SBC	5.375
Rhein-Kraftwerke **‡	20	1990	–	5	100	CS	5.000
Malaysia **‡	180	1988	–	6¼	98¾	SBC	6.551
Japan Exim Bank	100	1991	–	*	*	SBC	5.500
STERLING							
CEPME °‖	30	1995	11.4	11¼	100	Hill Samuel	11.250
GUILDERS							
Asian Devt. Bank ‡	150	1993	10	8¾	99	ABN, Amro Bank	8.905
YEN							
Danish Export Fin. **‡	5bn	1993	9	8.6	100	Mitsui Trust	8.600
Rautaruukki Oy **‡	5bn	1993	9	8.5	100	Mitsubishi Trust	8.500
Korea Devt. Bank ‡	10bn	1990	7	8.6	99¾	Nomura Secs.	8.649

* Not yet priced. ‡ Final terms. ** Placement. † Floating rate note. ∅ Minimum. § Convertible. ¶ With warrants. ‖ Includes FRN tranche. ° Convertible into a dollar FRN. Note: Yields are calculated on AIBD basis.

INTERNATIONAL CAPITAL MARKETS AND COMPANIES

U.S. BONDS

Renewed concern over interest rates hits prices

U.S. BOND prices took another battering last week reflecting extreme nervousness in the market about short-term interest rates and Federal Reserve Board policy.

In the government market the Treasury long-bond closed at around 96⅜ after the Fed announced another much larger than expected increase in M1. The Friday price drop brought the decline for the week to almost three points and to almost five points in the past 10 trading sessions. The long-bond is now yielding 10.76 per cent almost 50 basis points higher than just 18 days ago.

The malais in the government market was mirrored in the corporate sector. Corporate bond prices fell by over two and a half points while new issue volume slipped to $775,000, a 53 per cent decline over the previous week.

The market's poor performance reflects a number of factors which the Fed's policy-making Federal Open Market Committee (FOMC) will also have to face when it meets tomorrow.

Interest rates remain of primary concern. Last week short-term rates continued to nudge upwards. The three-months-Treasury bill rate closed at 8.29 per cent on Friday compared to 8.14 per cent a week ago. The Fed funds rate also moved higher averaging about 8.6 per cent over the past five trading sessions.

The main factors pushing up interest rates and bond yields over the past two weeks have been renewed concern about the money supply growth coupled with fears about the implication of a continuing budget deficit.

The $7bn increase in M1 reported on Friday followed a $4.2bn jump the previous week. This surge unnerved the market despite reassuring words from the Fed, administration officials and Wall Street's senior economists.

Mr Preston Martin, vice-chairman of the Fed, repeated that the board does not view M1 as "a useful tool" and Wall Street's economists got the message emphasising that the broader money supply measures M2 and M3 remain within the Fed's target ranges.

However, market psychology has undoubtedly changed. Reinforcing this renewed uncertainty was the failure of Congress and the administration to reach agreement last week on reducing the size of the expected budget deficit.

This failure implies a continuing hefty Treasury funding need and the threat that the public sector will crowd out corporate borrowers as the recovery picks up pushing interest rates higher.

While any real problems would be likely to surface next year rather than this, corporate bank borrowing remains depressed and that is a serious factor in market sentiment.

The market has recently benefited from a slight reduction in Treasury auctions because of the debt ceiling limit.

However, as Salomon Brothers points out, "the Treasury now has to make up the $5bn pay-down of bills to bring itself back to the original cash target in a period of particularly heavy issuance."

The Treasury still has to raise $33bn before the end of June and the market will get a taste of things to come this week with the $7.75bn auction of three-year notes tomorrow and the auction of $5.75bn of five-year notes on Wednesday.

The other factor which the market and the FONC are watching closely is the strength of the U.S. recovery. Most business leaders and economists agree that the recovery is still fragile and patchy. Nevertheless the economic data continues to confirm that it is under way. Despite this the inflation figures continue to look healthy. The April consumer price index figure is due out tomorrow and will certainly be a closely watched figure.

Paul Taylor

U.S. INTEREST RATES (%)

	Week to May 20	Week to May 13
Fed funds wkly aver	8.69	8.48
3-month T-bills	8.16	8.15
3-month CDs	8.50	8.30
30-year Treas bond	10.82	10.57
AAA Utility	11.50	10.92
AA Industrial	11.50	11.00

Source: Salomon Bros. (estimates). In the week ended May 11 M1 rose by $7bn to $506.9bn.

Wheelock Marden pays same despite downturn

BY ROBERT COTTRELL IN HONG KONG

WHEELOCK MARDEN, the Hong Kong shipping, trading and property group, had a sharp fall in net profits in 1982, down to HK$192.4m (U.S.$27.6m) from HK$535m in 1981.

When an extraordinary gain of HK$127.5m and an unrealised exchange gain of HK$1.8m are taken into account the group's atributable profit totals HK$322m, down more than 50 per cent on last year's HK$705.8m.

However, Wheelock is maintaining its final dividend of 18 cents for A shares and 1.8 cents for B shares making unchanged totals of 30 cents and 3 cents respectively. There is also to be a bonus payout of 5 cents for A shares and 0.5 cents for B shares.

The delay in publishing the group's annual report has given added impetus to the rumours circulating that Wheelock had had a bad year in 1982. On Friday its shipping subsidiary, Wheelock Maritime International, reported a net loss and said that it is seeking a loan of up to U.S.$12m from within the group to assist it with liquidity problems. Minority shareholders could object to the loan plan according to brokers.

Depressed shipping charter rates coupled with the poor state of Hong Kong's property market have combined to pull down Wheelock Marden's results from 1981's high levels. At the half-way mark Mr John Marden, the company chairman, had warned that no early improvement could be expected in the company's performance given the state of two of its three areas of operation.

Nippon Chemiphar suffers Y1.8bn loss

TOKYO — Nippon Chemiphar, the Japanese drug company, made a net loss of Y1.8bn ($7.7m) in the year ended March 31, compared with an after-tax profit of Y1.34bn

The loss reflects the cost of an 80-day suspension of its business ordered by the Health and Welfare Ministry after the company admitted fabricating clinical test data in order to obtain government authorisation to produce and distribute some new medicines.

The company is to cut its dividend total to Y7.50 per share, including a Y5 interim dividend, from the Y10 paid for 1981-82.

Sales fell to Y16.86bn from Y22.81bn with the total comprising Y12.84bn in the first half of the financial year and Y4.02bn in the suspension-hit second half.

The company has reported an extraordinary loss of Y1.34bn, including Y222m from the suspension of its two factories and Y876m from the disposal of drugs, the sale of which was banned by the Ministry.

Nippon Chemiphar said it expects to report a net profit of about Y300m on sales about Y13bn in the current year, ending March 31, 1984.

Reuter

Big demand for Saudi bank shares

JEDDAH—The Saudi Arabian Ministry of Commerce has approved a share allocation scheme to cope with massive public response to an initial stock offering by the Saudi Commercial United Bank (SCUB).

According to officials more than 418,000 Saudis made subscription requests totalling more than 7m shares in the offering, when the bank had allocated only 1.31m shares for public ownership. Each share has a par value of 100 riyals ($29).

The floated shares will be distributed roughly in proportion to each applicants subscription request.

Formed last December, SCUB is an amalgamation of United Bank of Pakistan, Melli Iran, the Lebanese Banque Liban et D'Outre Mer, and International Saudi Bank. Ninety-five Saudi businessmen also are co-founders of the new bank, based in Riyadh with a capital of 250m riyals.

Of the bank's 2.5m shares, each of the four founding banks owns 250,000 shares, while "constituent subscribers" hold 1.19m shares, and the remaining 1.31m will be owned by the public.

AP-DJ

First-quarter fall for Atlas Copco

ATLAS COPCO, the Swedish manufacturer of air compressors and mining equipment, has announced 1983 first quarter pre-tax profits of Kr70 ($9.3m) down from Kr155m for the first quarter of 1982, AP-DJ reports from Stockholm.

First-quarter sales totalled Kr1.87bn, down slightly from Kr 1.88bn and corresponding to a decline in volume of some 15 per cent.

The company blaimed the prolonged recession in world markets and higher foreign exchange losses for the lower volume sales and earnings. The first quarter profit margin, Atlas Copco noted, dropped to 3.8 per cent from 8.2 per cent in the same period of 1982.

Looking to the rest of 1983, however, Atlas Copco said it expected efforts to increase sales and rationalise operations, together with lower net interest costs, to bring full year results to the same level as 1982, when profits before appropriations and taxes were Kr 330m.

● NORPIPE, which owns the Ekofisk pipelines and terminals, has reported lower turnover and profits for 1982, reflecting a fall in throughput, Fay Gjester adds from Oslo.

Turnover fell to NKr 3.03bn from NKr 3.2bn in 1981, while profits after tax were NKr 223m ($3.1m), down by NKr 15m.

Fresh capital for Air France

PARIS — Air France is proposing a capital restructuring to cover part of the losses in its 1982 accounts. The airline reported a FFr 791.78m ($106.6m) loss for 1982.

It is proposing to repay FFr 818.1m of debt by cutting the nominal value of its shares to Fr22 from FFr 40, reducing its capital to FFr 999.9m from FFr 1.82bn.

Fresh capital totalling FFr 737m, through the issue of 33.5m shares at FFr 22, is planned mainly through the conversion of loans from government into shares.

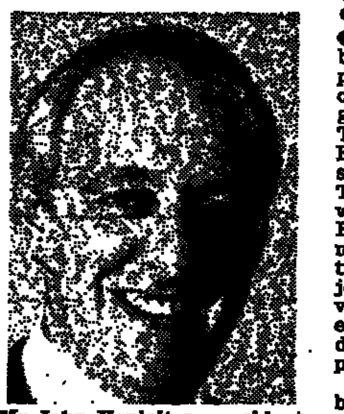
The government holds almost 99 per cent of Air France directly.

Reuter

INTERNATIONAL APPOINTMENTS

President for Sheraton Corp.

● Mr John Kapioltas has been named president and chief operating officer of SHERATON CORPORATION, the international hotel group. Mr Kapioltas was senior vice-president of the company, which is a subsidiary of ITT Corporation, and was also president of Sheraton Management Corporation, Sheraton's Europe, Africa, Middle East and India division where he will be succeeded by Mr Wollaston G. Morin, who will be based in Denham, England. For the past two years, Mr Morin has served as executive vice-president, Sheraton Management Corporation, and director of operations support for the division.



Mr John Kapioltas, president of Sheraton Corporation

● Mr Edward E. Hickam has been elected senior vice-president and group executive of the exploration & production group of TEXAS EASTERN TRANSMISSION CORP, a Texas Eastern Corp subsidiary. He also serves as president of subsidiary Texas Eastern Exploration Co, which is responsible for Texas Eastern's domestic and international exploration and production activities. Mr Hickam joined Texas Eastern in 1981 as vice-president and group executive of exploration and production, the position he held prior to this appointment.

Mr Howard C. Homeyer has been appointed to the newly created position of vice-president and deputy group executive of the gas group. He will also serve in the newly created capacity of executive vice-president of Texas Eastern Gas Pipeline, a division, and Transwestern Pipeline Co, a subsidiary. Formerly, Mr Homeyer was vice-president, financial planning division. Mr J. Michal Conaway, who was formerly director, corporate planning division, has been named director, financial and corporate planning. Mr Conway will retain responsibility for corporate planning, which will be transferred from the strategic development group to the finance group.

● Mr Colin G. Campbell, president of Wesleyan University, and Mr Worth Loomis, president of The Dexter Corp, have been elected to the boards of directors for eight mutual funds managed by CIGNA INVESTMENT MANAGEMENT CO, a company of CIGNA Corp.

● Mr George D. F. Lamborn has joined ACLI INTERNATIONAL COMMODITY SERVICES, INC as president, chief executive officer and chairman of the executive committee. Mr Lamborn has served as co-chairman of Refco International since 1981.

● NEWMONT MINING CORP has appointed Mr Edward P. Fontaine and Mr Gordon R. Parker directors. Mr Fontaine has been vice-president, finance, of Newmont since 1979. Mr Parker joined Newmont in 1981, as vice-president, operations, after having served since 1975 as managing director of Newmont's affiliates, O'okiep Copper Co in Cape Town.

● ALLIED CORPORATION has appointed Mr Peter J. Schiller as president of Instrumentation Laboratory, Inc. IL was acquired by Allied at the end of last month. Mr Thomas A. Rosse, who founded IL in 1959, will continue as chairman. He will provide overall policy guidance, particularly in research and product development. Mr Schiller, who has also been appointed executive vice president—diagnostic operations of Allied Health & Scientific Products Co, will have overall responsibility for Allied's growing commitment to the diagnostics segment of the worldwide health care market. Most recently he served as corporate vice president with responsibility for carrying out the Allied-Bendix consolidation.

● JWT GROUP, INC has elected Mr William S. Sneath and Mr Richard A. Giesen to its board. Mr Sneath is the former chairman and chief executive officer of Union Carbide Corp; from which he retired in 1981. Mr Giesen was president and chief executive officer of Field Enterprises, Inc, a publishing, communications, and real estate company.

● Mr Bernard Imseng, senior vice-president of Union Bank of Switzerland in Zurich, has been elected to the newly-created position of vice chairman of CEDEL.

● Mr James M. (Jim) Keane has been named president of THE FANTUS COMPANY INC, a subsidiary of PHH Group Inc. He was senior vice president of operations at Homequity, another PHH Group company.

Mr John J. (Jack) Gottsman has been named president of Homequity. He succeeds Mr Robert D. Kanisch, who leaves to assume full-time corporate responsibilities for all personnel-related services as executive vice president at PHH Group. Mr Gottsman was president of ARA Transportation Inc.

● Mr Paul H. Henson, chairman and chief executive officer of United Telecommunications Inc, Kansas City, Missouri, has been elected to the board of THE WILLIAMS COMPANIES.

● PPG INDUSTRIES has elected three executives to the newly-created post of group vice-president, with worldwide product line responsibility. Mr William R. Harris has been elected group vice-president, chemicals; Mr Edward J. Slack, group vice-president, glass and fibre glass; and Mr Malcolm G. Slaney, group vice-president, coatings and resins. Mr Harris had been vice-president and general manager of the industrial chemical division since 1980. Mr Slack had been vice-president and general manager of the fibre glass division since 1980. Mr Slaney had been vice-president and general manager of the coatings and resins division since 1977.

● Dr Mickey D. Levy is to join FIDELITY BANK as senior vice-president and chief economist. Dr Levy, chief economist with Florida's Southeast Bank, will assume responsibility for Fidelity's economics group and the bank's econometric model of the U.S. economy.

FT INTERNATIONAL BOND SERVICE

U.S. DOLLAR STRAIGHTS	Issued	Bid	Offer	Change on day	Change on week	Yield
Amex O/S Fin. 10¾ 90	100	98½	98¾	0	0	10.58
Amro Bank 13 89	200	107¾	108¼	−0⅛	−0½	11.16
Bk. of Amer. 8 88 XW	150	89¾	90¼	0	−0½	10.75
Bk. of Tokyo Hd. 11 90	100	99½	100	−0¼	−0⅝	11.04
British Col. Hyd. 10¾ 88	200	99¾	100⅜	0	−0⅜	10.28
Canadair 12½ 89	175	106⅞	107⅜	−0⅛	−0⅞	10.88
Canadian Wheat 11¼ 90	50	101⅞	102⅜	+0⅛	−0⅜	10.79
CIBC 11 90	75	98¾	98⅞	+0⅛	0	11.29
Coca Cola Int. 9⅞ 92	100	28	28½	0	−0⅛	10.52
Coca Cola Int. 11¾ 89	100	100⅝	100⅝	0	0	10.40
Cr. Suisse Bah. 10½ 90	150	105¼	105¾	0	−0⅛	10.52
Credit Suisse 10½ 89	100	103¼	103¾	0	+0⅛	9.73
Den Norsk Crd. 11¼ 93	50	97⅝	98⅛	+0⅛	−0⅛	11.62
Du Pont 11¾ 95	150	103¼	103¾	−0⅛	−0½	10.69
EDC 10¾ 88	100	100½	101	−0⅞	−0⅛	10.50
EDC 11¾ 87	100	103⅛	103⅝	−0⅛	−0½	10.68
EDF 11⅛ 93	100	97½	98	−0⅛	−0⅛	11.51
EEC 10¾ 95	75	96½	97	0	−0½	11.25
EEC 11½ 95	200	100⅝	101⅛	0	−0⅜	11.34
EIB 11 91	125	99⅞	100⅜	+0¼	−0⅛	10.96
Forsmarks 13¾ 92	75	108⅛	108⅝	+0⅛	−0⅛	12.17
Fuji Int. Fin. 10⅞ 90	100	98¾	98⅞	−0⅛	−0⅞	11.17
Gaz de France 12¼ 93	175	101⅝	102⅛	−0⅛	−0⅜	11.91
Gen. Elec. Credit 9¾ 91	100	16	16½	0	−0⅛	10.44
Gen. Elec. Credit 12 89	100	106⅝	107⅛	−0⅛	−0⅛	10.44
GMAC O/S Fin. 10½ 90	200	100⅜	100⅞	−0⅛	−0⅛	10.34
Gulf Oil Fin. 12¼ 87	100	104	104½	0	−0⅛	10.93
Honeywell Int. 10¾ 90	100	100¼	100⅝	0	+0⅛	10.66
IBM Wld. Trade 12¼ 92	200	109½	110⅛	0	−0⅜	10.52
Ind. Bk. Japan 10⅞ 88	100	99⅛	99¾	−0⅞	−0⅛	11.00
Japan Air Lines 10⅞ 98	42	96⅝	97⅛	−0¼	−0⅞	11.30
Manitoba 11¾ 89	125	104⅞	105⅛	−0⅛	−0⅛	10.59
Merrill Lynch 10⅝ 90	200	99½	99¾	−0⅞	−0⅞	10.72
Midland Int. F. 11½ 92	150	101⅝	102⅛	−0⅜	−0⅛	11.14
Mitsubishi Cpn. 10½ 90	100	97⅞	98½	−0⅛	−1	10.89
Nat. West. Fin. 11¾ 92	150	103⅝	104⅛	−0⅛	0	11.04
Nippon Credit 11 90	100	98⅜	98⅞	−0⅛	−0⅛	11.36
Nippon Credit 11¼ 93	100	98¾	99¼	−0⅛	−0½	11.43
OKB 10 91	100	95¾	96¼	−0⅛	−0⅜	10.79
Ontario Hydro 11¼ 89	200	103½	104¼	+0⅛	−0½	10.36
Ontario Hydro 12¾ 92	200	109¼	109⅞	+0¼	−0⅛	11.03
Prudential O/S 10⅝ 93	100	100⅜	100¾	0	−0⅜	10.55
Prudential O/S 12¾ 87	150	108	108½	−0⅞	−0⅞	10.28
Quebec Hy. 11½ 92 (D)	100	102⅛	102⅝	−0⅛	−0½	11.06
R. J. Reynolds 12¾ 89	100	106⅝	107⅛	−0⅛	−0⅝	11.75
Saskatchwn. Pr. 10¾ 90	125	99⅞	100⅜	−0⅛	−0½	10.71
SNCF 11½ 93	100	99½	100	+0⅛	−0⅜	11.53
S. Cal. Edison 10½ 90	75	99½	100	−0⅞	−0½	10.65
Swiss Bk. Cpn. 10¾ 90	125	102⅜	102⅞	+0⅛	+0⅛	9.67
Texaco Capital 9¾ 90	150	96⅜	96¾	−0⅛	−0⅛	10.48
UBS 10 88	100	101½	102	0	−0⅛	9.53
UBS 11 89	150	103½	103⅞	+0⅛	−0⅛	10.18
Walt Disney Pr. 12½ 88	75	106⅛	106⅝	−0⅛	−0½	10.94
Westpac Int. Fin. 11 90	100	†97⅜	97⅞	−0⅛	−1½	1.36
World Bank 10⅛ 88	150	99⅜	99⅞	−0⅛	−0⅛	10.46
World Bank 10⅞ 93	100	99⅝	100⅛	−0⅛	−0⅞	10.89
World Bank 11⅛ 98	100	99⅝	100⅛	−0⅛	−1⅛	11.11

Average price changes... On day −0⅛ on week −0½

DEUTSCHE MARK STRAIGHTS	Issued	Bid	Offer	Change on day	Change on week	Yield
Australia 6⅞ 93	200	99⅜	99⅞	−0⅛	−0⅛	6.92
Bank of Tokyo 7¼ 90	100	99⅝	100⅛	+0⅛	−0⅛	7.22
Bayer Capital 7¾ 89	150	103⅝	104⅛	−0⅛	−1	6.88
Caisse N. Energie 8 93	100	99½	100	−0⅛	−0⅛	8.03
Caisse Nat. Tele. 7¾ 93	200	98	98½	0	−0⅛	8.01
FCSC 7½ 93	150	98½	99	−0¼	−0⅞	7.68
EFC 7¾ 95	200	99⅝	100⅛	−0⅛	−0⅛	7.74
EEC 8 94	200	100⅝	101⅛	−0⅛	−0½	7.89
FSCOM 8⅞ 90	150	101⅛	101⅝	0	−0⅞	8.20
Eurofima 7½ 91	100	101⅝	102⅛	0	0	7.19
Ferrovie Dello 8¾ 88	150	101⅝	102⅛	−0⅞	−0⅛	8.21
H. J. Heinz Int. 8¾ 88	50	100½	101¼	−0⅞	−0⅛	6.52
Int.-Am. Dv. Bk. 7¾ 93	200	97⅝	98½	−0⅞	−0¼	8.07
Int.-Am. Dv. Bk. 8¼ 93	150	100⅝	101⅛	−0⅞	−0⅛	8.08
Ireland 8½ 90	150	101⅝	101⅞	0	−0⅛	8.17
Ireland 8⅞ 91	150	101¾	102½	−0⅛	−0⅜	8.47
ITT Antilles 7 93	200	98	98½	0	0	7.25
McDonalds Fin. 7¼ 92	100	100⅞	101⅜	−0⅛	−0½	6.93
Mitsui OSK 7¼ 88	100	100⅜	100⅞	−0⅛	−0½	7.11
Mount Isa Fin. 7¾ 90	100	98¾	98⅞	0	+0⅞	7.91
Quebec Hydro 8 93	200	102	102½	−0⅞	−0⅛	7.66
Sweden Kingdom 8¼ 89	150	102⅝	103⅛	−0⅛	−0⅛	7.69
Volkswagen Int. 7¾ 93	200	97⅝	98⅛	−0⅛	−0¼	7.56
World Bank 7½ 93	200	97⅝	98⅛	0	−0⅛	7.54
World Bank 7½ 93	300	98⅝	99⅛	−0½	−0⅛	7.66

Average price changes... On day −0⅛ on week −0¼

SWISS FRANC STRAIGHTS	Issued	Bid	Offer	Change on day	Change on week	Yield
Air Canada 5½ 95	100	100⅛	100⅝	+0¼	+1	5.27
Akzo 5⅝ 93	100	99	99¼	+0½	0	5.74
American Exprs. 4¾ 93	100	94½	95	−0⅞	0	5.44
Asian D. B. 5⅞ 95	100	99½	99¾	+0½	+0⅛	5.92
BTR Finance 5¾ 93	75	98	98½	0	+0½	5.89
Carls-Tuborg B. 5¾ 93	60	102½	102¾	+0⅛	0	5.40
Chujitsuya Co. 5⅞ 93	50	97½	97⅞	−0⅛	0	6.20
EIB 5¾ 93	100	98½	99¼	0	0	5.90
Ex-Im. Bk. Japan 5 93	100	96	96½	−0⅛	−0⅛	5.60
Fuji Electric Co. 6 93	100	102	102¼	0	0	5.77
Gothenb'g Airport 6 93	80	100	100¼	0	−0⅛	5.98
HCA Finance 5 93	100	97¾	98	0	−0¼	6.28
Japan Dev. Bank 5½ 93	100	98⅝	99	0	−0⅛	5.65
Manitoba Prov. 5¾ 93	100	101½	101¾	+0½	0	5.03
Nippon Express 6 93	50	101½	101¾	−0½	+1	5.77
Nippon Kokan 5⅞ 93	100	95⅞	96⅛	−0⅛	+0⅛	6.18
Norsk Hydro 5½ 98	100	98⅛	98½	+0⅛	−0⅛	5.66
Quebec Hydro 5½ 93	100	100½	100¾	+0⅛	+0¼	5.42
Sekisui House 6 93	100	100⅜	101	+0⅛	+0½	5.88
Shikoku El. Pow. 5¾ 93	100	97¾	98	0	−0⅛	5.91
Tohoku El. Power 6 93	100	100⅛	100½	0	−0⅛	5.95
Transcanada Pipe 5¾ 93	100	98½	98¾	0	−0½	5.94
Trizec Corpn. 6¼ 91	100	102	102¼	0	+0⅛	5.90
Un. Bk. Norway 5¾ 93	60	98	98⅛	+0⅛	+0⅛	5.63
Volvo 5⅛ 91	60	99⅛	100	−0⅛	−0⅛	5.39
World Bank 5½ 93	100	99½	99¾	+0⅛	0	5.55

Average price changes... On day +0⅛ on week +0⅛

YEN STRAIGHTS	Issued	Bid	Offer	Change on day	Change on week	Yield
Australia 8¼ 92	15	105⅛	106⅛	+0⅛	0	7.75
EIB 8¼ 92	15	102⅞	103⅜	+0⅛	+0⅛	7.74
Japan Airlines 7⅞ 87	9	†101⅞	102¼	+0⅛	+0½	7.16
New Zealand 7¾ 89	15	101⅛	101⅞	0	−0½	7.28
World Bank 8¼ 92	20	103½	104⅛	−0⅛	−0⅛	7.74

Average price changes... On day 0 on week +0⅛

OTHER STRAIGHTS	Issued	Bid	Offer	Change on day	Change on week	Yield
CEPME 12½ 90 C$	50	†99½	100	+0⅛	+0⅛	12.52
Farm Credit 12¾ 93 C$	50	†102⅞	103⅛	0	−0½	11.59
Intprv. Pipe. 12¼ 93 C$	50	†99½	100	+0⅛	+0⅛	12.29
Mont. Trans. 12½ 90 C$	20	†98½	99⅛	0	+0⅛	12.65
Pancanadian 12½ 93 C$	50	98⅛	100⅛	−0⅛	−0⅛	12.48
Quebec Hyd. 14 92 C$	60	†107½	108½	0	0	12.48
Swed. E. Cr. 12¾ 88 C$	50	†103⅜	104⅛	0	−0⅛	11.15
EIB 11¾ 91 ECU	60	100⅝	101⅛	0	0	11.53
Queb. Prv. 11½ 88 ECU	50	98⅞	99⅛	+0⅛	+0⅞	11.88
Austria 7½ 88 Fl	100	98⅝	98⅞	−0⅛	−0⅛	7.88
Consol. Foods 7¾ 88 Fl	100	97⅜	98⅜	0	−0½	7.78
Nederland Gas 7¾ 88 Fl	100	99½	100	−0⅛	−0⅛	7.55
Philips Lamps 7¾ 88 Fl	100	99½	100	0	−0½	7.30
Quebec Prov. 7¾ 88 Fl	100	98⅝	99⅛	+0⅛	−0⅛	7.75
World Bank 7 88 Fl	150	97⅛	97⅝	0	−0⅛	7.67
OKB 14 86 FFr	400	99⅛	100⅛	0	0	14.03
Solvay et C. 14¼ 86 FFr	200	100⅛	101⅛	0	0	14.28
BFCE 11½ 88 £	50	97¾	98½	+0⅛	−0⅛	12.02
BFCE 14½ 87 £	30	107⅞	108⅛	0	0	11.86
British Oxyg. 11¼ 91 £	50	98⅛	99⅛	0	−0⅛	12.00
CNT 12¾ 89 £	20	101½	102½	+0⅛	0	12.00
EEC 11⅞ 91 £	50	100⅛	101⅛	+0⅛	+0½	11.67
Fin. for Ind. 12¾ 88 £	30	103⅛	104⅛	0	0	11.15
F. Mat. Oranji. 12⅜ 92 £	30	103⅛	104⅛	0	0	11.94
Gen. Elec. Co. 12¾ 89 £	50	104⅛	105⅛	−0⅛	−0½	11.18
Mort. Bk. Fin. 11¾ 89 £	15	96⅝	97⅜	−0⅛	−0⅛	12.32
Norsk Hydro 12 90 £	30	101⅛	102⅛	0	−0⅛	11.58
Norsk Hydro 14½ 87 £	30	108	109	+0⅛	+0½	11.76
Quebec 14½ 89 £	30	108⅛	109⅛	−0⅛	−0⅛	12.26
SDR France 15½ 92 £	30	107	108	0	−0⅛	13.95
SNCF 11½ 89 £	30	97¼	98	−0⅛	−0⅛	12.01
Tenneco Int. 14¾ 87 £	30	†108½	110	0	0	11.79
World Bank 11¾ 91 £	75	98⅛	99½	0	−0⅛	11.66
Euratom 11 93 LuxFr	500	104	105	0	+0⅛	10.22
Europarat 10¾ 93 LuxFr	600	103⅛	104⅛	0	+0⅛	10.13

FLOATING RATE NOTES	Spread	Bid	Offer	C.dte	C.cpn	C.yld
Bk. of Tokyo 5⅛ 91 (D)	0⅛	98⅞	100⅛	10/6	9⅝	9.74
BFCE 5⅛ 87	0⅛	99⅛	99⅝	27/7	9.94	9.99
BFCE 5⅛ 88	0⅛	99	99⅜	20/7	9⅝	9.33
Caisse Nat. Tele. 5⅛ 90	0⅛	99⅜	99⅞	21/10	9.56	9.62
CCF 5⅛ 95	0⅛	99⅛	99⅝	7/10	10.19	10.22
CCF 5⅛ 98	0⅛	99⅝	100	24/9	9.94	9.95
CEPME 5⅛ 88 WW	0⅛	99⅛	99⅜	3/6	5⅛	5.28
CEPME 5⅛ 92	0⅛	99⅝	99⅞	10/8	9.94	9.97
Chemical NY 5⅛ 94	§0⅛	100⅛	100⅛	23/6	9⅞	9.85
Credit Agricole 5⅛ 97	0⅛	99⅛	99⅝	24/9	10	10.06
Credit du Nord 5⅛ 92	0⅛	98⅞	99	23/6	10⅛	10.24
Credit Lyonnais 5⅛ 94	0⅛	98⅞	99⅜	5/7	9⅝	9.82
Credit Lyonnais 5⅛ 97	0⅛	99⅛	99⅝	1/10	10.06	10.11
Credit Nat. 5⅛ 94	0⅛	98⅞	99⅛	9/9	9¼	9.33
EDF 5⅛ 95 XW	0⅛	99⅛	99⅝	10/8	10	10.06
Kansallis Osake 5½ 92	0⅛	99⅝	100	8/11	9⅛	9.14
Long Term Credit 5⅛ 92	0⅛	100	100⅛	27/5	10⅛	10.11
J. P. Morgan 5⅛ 97	§0⅛	100⅛	100⅛	12/8	9	8.98
New Zealand 5⅛ 87	0⅛	100⅛	100⅝	7/10	10.06	10.02
NZ Steel Dev. 5⅛ 92	0⅛	99⅞	100⅛	22/8	10.19	10.19
Nippon Credit 5⅛ 90	0⅛	99⅞	100⅛	10/8	9⅞	9.89
Scotland Int. 5⅛ 92	0⅛	100	100⅛	23/9	9.94	9.93
Sec. Pacific 5⅛ 91	0⅛	†100⅛	100⅝	24/6	10.06	10.04
Societe Generale 5⅛ 95	0⅛	99⅛	99⅝	1/9	9½	9.55
Standard Chartd. 5⅛ 91	0⅛	98⅞	100⅛	18/11	9.19	9.19
Sweden 5⅛ 89	0⅛	99⅛	99⅝	28/8	9⅝	9.66
Sweden 5⅛ 93	0⅛	99⅝	100⅛	3/8	10.19	10.20

Average price changes... On day 0 on week −0⅛

CONVERTIBLE BONDS	Cnv. date	Cnv. price	Bid	Offer	Chg. day	Prem
Ajinomoto 5⅛ 96	7/81	849.2	100	101½	−0⅛	8.70
Bridgestone Tire 5½ 96	3/82	470	110¼	111⅛	+0½	4.07
Canon 7 97	7/82	748.2	191½	193½	−0⅞	0.22
Fujitsu Fanuc 4⅛ 96	10/81	4481	119½	121⅛	−0½	8.81
Hitachi Cable 5⅛ 96	2/82	515	94½	96	−1½	0.09
Honda Motor 5⅛ 97	3/82	759.6	111	112¼	+0½	0.01
Kawasaki 5⅛ 96	9/81	229	80½	82	−0⅛	19.94
Kumagai Gumi 6½ 97	10/82	400	110½	112	−0⅛	1.51
Kyowa Hakko 6⅛ 97	2/83	762	101½	103	0	8.78
Marui 6 96	7/81	769.5	126	127½	+0⅞	3.03
Minolta Camera 5 96	10/81	826.4	80½	82	−0⅛	35.73
Mitsubishi Elec. 5⅛ 96	6/83	396	96⅛	97⅛	+0⅛	2.97
Murata 5⅛ 96	7/81	1714	116½	118	−0⅛	4.69
Nippon Electric 5⅛ 97	2/82	765.9	132⅞	134½	+0⅛	5.18
Nippon Oil Co. 5½ 98	4/83	964	100	101⅛	−1⅛	8.14
Nissan Motor 5⅛ 98	4/83	770	95⅞	97⅛	−0⅛	0.18
Olympus Optic. 6⅛ 97	12/82	1331	96	98½	0	6.51
Orient Finance 5⅛ 97	3/82	927.2	104½	106	−0⅛	0.13
Sumitomo Elec. 5½ 97	3/82	577.3	99½	100⅛	−0⅛	0.03
Sumitomo Met. 5⅛ 96	10/81	296.1	75½	77⅛	0	46.22
NEC Cpn. 3½ 93 SwFr	6/83	978	108½	110⅛	+0⅛	4.07
Sanyo Elec. 3½ 93 SwFr	5/83	501	102⅛	104⅛	+0½	10.18
Konishiroku 6⅛ 88 DM	6/82	816	113	114	+0⅛	6.86
Mitsubishi H. 6 89 DM	2/82	263	106⅞	108⅛	−0⅛	19.29
Sum Realty 6⅛ 92 DM	2/83	385	115⅛	116⅛	−0⅞	0.14

EUROBOND TURNOVER

(nominal value in $m)

	Cedel	Euro-clear
U.S. $ bonds		
Last week	‡	12,196.1
Previous week	7,330.7	13,301.8
Other bonds		
Last week	‡	1,235.4
Previous week	1,215.7	989.5

‡ Figures not available.

* No information available—previous day's price.

† Only one market maker supplied a price.

STRAIGHT BONDS: The yield is the yield to redemption of the mid-price; the amount issued is in millions of currency units except for Yen bonds where it is in billions. Change on week=Change over price a week earlier.

FLOATING RATE NOTES: Denominated in dollars unless otherwise indicated. Coupon shown is minimum. C.dte=Date next coupon becomes effective. Spread=Margin above six-month offered rate. (‡ three-month; § above mean rate) for U.S. dollars. C.cpn=The current coupon. C.yld=The current yield.

CONVERTIBLE BONDS: Denominated in dollars unless otherwise indicated. Chg.day=Change on day. Cnv. date=First date for conversion into shares. Cnv.price=Nominal amount of bond per share expressed in currency of share at conversion rate fixed at issue. Prem=Percentage premium of the current effective price of acquiring shares via the bond over the most recent price of the shares.

The list shows the 200 latest international bonds for which an adequate secondary market exists. The prices over the past week were supplied by: Kredietbank NV; Credit Commercial de France; Credit Lyonnais; Commerzbank AG; Deutsche Bank AG; Westdeutsche Landesbank Girozentrale; Banque Generale du Luxembourg SA; Banque Internationale Luxembourg; Kredietbank Luxembourg; Algemene Bank Nederland NV; Pierson, Heldring and Pierson; Credit Suisse/Swiss Credit Bank; Union Bank of Switzerland; Akroyd and Smithers; Bank of Tokyo International; Chase Manhattan; Citicorp International Bank; Credit Commercial de France (Securities) London; Daiwa Europe NV; EBC; First Chicago; Goldman Sachs International Corporation; Hambros Bank; IBJ International; Kidder Peabody International; Merrill Lynch; Morgan Stanley International; Nomura International; Orion Royal Bank; Robert Fleming and Co.; Samuel Montagu and Co.; Scandinavian Bank; Societe Generale Strauss Turnbull; Sumitomo Finance International; S. G. Warburg and Co.; Wood Gundy.

Closing prices on May 20

Hammerson chief warns on growth setback

BY ALISON HOGAN

Hammerson Property Investment and Development Corporation which has more than doubled its profits in the last three years, will not sustain the same growth levels in the next three years, according to Mr Sydney Mason, chairman.

"The short-term outlook for the property investment and development industry is not good," Mr Mason warns shareholders in Hammerson's annual report published today. He says the underlying economic conditions are too uncertain for Hammerson to risk financing many new property investments.

At the same time, the company has almost completed the acquisition of minority interests in its existing portfolio so that it can expect no further growth from this source. Last year it increased it participation in the Brent Cross shopping centre from 16 per cent to around 40 per cent and benefited from 66 rent reviews.

Mr Mason says Brent Cross is trading well and that substantial premiums have been obtained by the few tenants who have assigned their leases.

The company also attributes its major expansion in Australia to the acquisition of the interests of the Standard Life Assurance company and the Australian Mutual Provident Society in several properties. It warns that the "very satisfactory profit" generated from trading ventures will probably not be repeated in 1983.

Hammerson will probably reduce the extent of its trading operations and hold more properties for investment because of poor market demand. Mr Mason says: "The present unstable economic climate prohibits the processing of many trading ventures rapidly and profitably and demands the application of the strictest criteria before committing funds to such projects."

Mr Mason says that although there are some regional variations the picture worldwide is of over-supply of commercial accommodation which must dampen short-term increases in rentals and values.

Hammerson, Britain's second largest property development company has a wide spread of well-managed properties and Mr Mason says he is confident that the company is well placed to explore opportunities which arise as economic conditions improve. The U.S. is the brightest spot and Hammerson is opening a second office in Los Angeles.

Hammerson had a good year for net rental income in 1982 which rose by over 25 per cent to £42.2m, not likely to be repeated in 1983. Gross profits from property trading almost doubled from £1.21m to £2.34m.

Development and trading properties are included in the balance sheet at cost. Development properties have been reduced from £80.35m to £59.79m mainly due to the completion of its huge Bow Valley Square development in Calgary, Canada.

Trading properties are valued at £18.9m, compared with £16.2m. Hammerson's first ever internal valuation of fully developed investment properties produced a portfolio worth £911m.

BOARD MEETINGS

The following companies have notified dates of board meetings to the Stock Exchange. Such meetings are usually held for the purpose of considering dividends. Official indications are not available as to whether the dividends are interims or finals and the subdivisions shown below are based mainly on last year's timetable.

TODAY

Interims—ANZ Bank, Concentric, Cosalt, Pyke.

Finals—Associated British Foods, Cakebread Robey, Frank G. Gates, Southwest Resources, Toshiba.

FUTURE DATES

Interims—	
General Stockholders Inv Tst	May 25
Greenall Whitley	May 26
Hardanger Properties	May 24
London Scottish Finance	June 1
Moran Tea	May 27
North British Steel	May 27
RHP	May 26
Spencer Clark Metal Industr's	May 26
Stockholders Investment Trust	May 26
Finals—	
Computer and Systems Engrng	June 3
De La Rue	June 1
Dundee and London Inv Trust	June 21
Readicut International	May 31
Rowlinson Securities	June 2
United Electronic	June 14

Citifunds makes offer in five currencies

Citifunds, an open ended investment company incorporated in Jersey, is offering up to 60m Participating Redeemable Preference shares of U.S. 1 cent each.

Citifunds aims to provide a professionally managed investment in the currency or currencies of the investors choice yielding a money market rate of return combined with low risk. Investors will be able to invest in any one or more of the following five currencies: Deutschemarks, yen, sterling, Swiss franc and U.S. dollar. The minimum subscription to the currency funds is: U.S.$5,000, DM 10,000, Y1.25m, £3,000, SwFr 10,000.

Separately from the five currency funds, investors may invest in participating shares in the managed fund in which the managers select on a discretionary basis the currency or currencies in which investments are denominated. Those shares will be denominated in U.S. dollars and the minimum initial subscription to the managed fund is $5,000.

● comment

The Citifunds launch comes hard on the heels of the very similar County Bank Currency Fund offering, and is fortuitously timed to benefit from pre-election sterling nervousness—the initial offer closes just three days before the general election. There is a full range of services available, including a money market rate of return (with rolling up of interest) in five currencies, together with easy switching, and with an additional managed fund facility (for which there are extra charges). The big money will probably come from corporate treasurers, but with a minimum investment of £5,000 (or the equivalent in other currencies) there is certainly room for private investors too.

RESULTS AND ACCOUNTS IN BRIEF

RILEY LEISURE (snooker and keep fit equipment)—Results for 17 months to the end of December 1982 reported April 9. Shareholders' funds £7.91m (£2.2m for the 12 months to July 1981): fixed assets £6.19m (£1.86m); net current assets £1.27m (£566,000); decrease in net liquid funds £1.47m (£438,000 increase). Meeting: The Connaught Rooms, Great Queen St., WC on June 9 at 12.30 pm.

CAMREX (HOLDINGS) (marine and industrial coatings manufacturer)—Results for 1982 reported April 22, 1983. Shareholders funds £6.63m (£5.84m); fixed assets £3.48m (£3.27m): net current assets £2.06m (£1.6m): net decrease in working capital £637,000 (increase £813,000). Hawley Group holds 28.56 per cent of ordinary shares. Meeting: Sunderland, June 9 at noon.

OWEN OWEN (department stores group)—Results for the year to January 29, 1983 reported on April 22. Ordinary shareholders' funds £21.11m (£24.75m); net current assets £2.88m (£8.28m); fixed assets £21.98m (£24.02m). Auditors note that as explained in the accounts, there is necessarily a degree of uncertainty in assessing the realisability in full of a loan of £1.28m regarding a former Canadian subsidiary. Meeting: Liverpool, June 9 at 11.30 am.

AQUASCUTUM GROUP (clothing manufacturer and distributor)—Results for year ended January 31, 1983 reported April 22. Group net current assets £9m (£8.64m); fixed assets £2 11m (£1.99m); shareholders' funds £10.89m (£10.31m); increase in working capital £185,000 (£416,000 decrease). Chairman says rationalisation programme should be complete by the end of this year and then the company will start to move towards improved profitability. Meeting, 100 Regent Street, W, June 9, noon.

DARES ESTATES (buildings and development)—Results for 1982 reported on May 12, 1983. Shareholders' funds £7.85m (£6.99m); fixed assets £895,711 (£287,105); net current assets £7.3m (£4.25m); increase in working capital £3.4m (£1.35m). Meeting: Birmingham, June 10 at noon.

THOMSON T-LINE CARAVANS—Results for 1982 reported on April 20 1983. Shareholders' funds £1.1m (£1.07m); fixed assets £1.61m (£1.82m): increase in working capital £196,704 (decrease £628,667). The accounts have again been qualified on a going concern basis. Meeting: Falkirk, June 8 at noon.

FARNELL ELECTRONICS (maker and distributor of electronic and electrical equipment)—Results for year to January 30, 1983, reported April 29. Group fixed assets £6.03m (£4.22m); net current assets £20.58m (£16.7m): shareholders' funds £24.38m (£20.09m): increase in working capital £3.59m (£997,000); increase in net liquid funds £1.23m (£1.42m). Meeting, Leeds, June 16, 1 pm.

CENTRAL AND SHEERWOOD (engineering, distribution, printing and publishing, financial services)—Results for 1982, reported May 5, 1983. Group fixed assets £16.48m (£15.5m); net current assets £16.03m (£18.59m): shareholders' funds £24.26m (£25.81m); working capital decreased £0.51m (£3.37m increase). Chairman believes loss makers have been eliminated. If so, he says, the company can look forward to considerably better results by the end of 1983. Meeting: Hyde Park Hotel, SW, June 9, noon.

J. E. ENGLAND AND SONS (WELLINGTON)—Results for the year ended January 1, 1983, reported April 9. Group shareholders' funds £947,615 (£1.32m). Fixed assets £684,389 (£708,117). Net current assets £213,182 (£465,251). Decrease in working capital £258,157 (£68,873 increase). Meeting: Telford, June 9, noon.

HORACE CORY (chemical colour manufacturer).—Results for 1982 reported on April 22. Shareholders' funds £3.11m (£3.05m); fixed assets £1.78m (£1.81m); current assets £2.01m (£1.73m), includnig debtors £636,731 (£480,042) and bank balances and cash in hand £119,315 (£38,060); net current assets £1.37m (£1.28m); increase in working capital £190,529 (£68,848 decrease). Mr S. J. S. Eley will retire as chairman at the annual meeting. His successor is Mr John Finchett. Meeting: 17, Southampton Place, WC, June 10, at noon.

HOPKINSONS HOLDINGS (manufacturer of valves)—Results for year to January 28 1983 reported April 30. Group fixed assets £6.91m (£6.64m); current assets £37.82m (£35.41m); current liabilities £16.49m (£15.3m): shareholders' funds £28.24m (£26.76m). Increase in working capital £0.71m (£1.71m decrease). Capital commitments £478,000 (£18,000). Chairman says trading conditions continue to be difficult, and with order books remaining at previous levels, the company has the capacity to take advantage of an improvement in the market; overall it is trading profitably. Meeting, Huddersfield, June 7, noon.

BIDDLE HOLDINGS (heating, air conditioning, lifts)—Results for 1982 reported on April 21, 1983. Shareholders' funds £6.1m (£5.54m); fixed assets £1.12m (£1.11m); current assets £9.77m (£8.72m) including debtors and prepayments £3.11m (£2.85m) and bank balances and cash £1.95m (£1.76m): current liabilities £4.59m (£4.09m)—net current assets £5.19m (£4.63m). Meeting: Cafe Royal, Regent Street, W, May 25, at noon.

COATES BROTHERS (printing inks, printers supplies)—Results for 1982 and current year prospects reported April 7. Group shareholders' funds £67,946 (£64,211). Fixed assets £44,259 (£44,548). Net current assets £32,964 (£27,689). Decrease in net borrowings £860,000 (£2.72m increase). Meeting: Stationers' Hall, Ludgate Hill, EC, June 10, 11.30 am.

HEADLAM, SIMS & COGGINS (footwear manufacturer)—Results for year to January 31, 1983, reported on May 11. Shareholders' funds £2.3m (£2.23m); fixed assets £606,878 (£626,595); net current assets £1.7m (£1.61m). Decrease in net liquid funds £509,875 (£281,595 increase). Chairman says there are signs of improvement and he is hopeful that there is a better year in prospect. Meeting: Cumberland Hotel, Marble Arch, W, June 10, at 11 am.

FT Share Information

The following securities have been added to the Share Information Service: Breakwater Resources (Section: Canadians); Merrydown Wine (Beers); American General Corpn. (Insurance); Arcolectric "A" (Electricals); Atlantic Metropolitan (Property); Greenwich Resources (Canadians); Samantha Exploration (Mines); Samson Exploration (Mines); Yorkgreen Invs. (Industrials).

SHARE STAKES

Whatlings:—Epicure Holdings together with any of its subs or associates is now interested in 500,000 ordinary (12.5 per cent). Epicure had previously notified an interest by itself and subs in 360,000 shares (9.0 per cent).

Isle of Man Steam Packet Company:—James Fisher & Sons has acquired further shares amounting to 5.3 per cent and now holds 8.34 per cent of the equity.

EQUITIES

Issue price	Amount paid up	Latest Renunc. date	1983 High	1983 Low	Stock	Closing price	+ or −	Net Div.	Times Covered	Gross Yield	P.E. Ratio
§68	F.P.	20/5	103	80	✠Bensons Crisps 10p	80	......	g1.9	3.1	3.4	10.6
¶315	F.P.	17/6	315	300	Bosse Massimi Pollitt	308	......	b4.5	2.6	2.1	26.1
§110	F.P.	3/6	160	118	✠Bryant (Derek) 10p	122	...	u5.25	2.0	6.2	11.9
§80	F.P.	—	79	75	✠Castle (G.B.)	75	...	b2.5	1.9	4.8	15.4
115	F.P.	—	128	103	✠Chem.Meth.Ass Inc	103	−7	bQ5½c	2.6	3.6	10.7
¶225	F.P.	6/5	253	220	Datastream 5p	225	+1	b2.25	3.5	1.4	28.5
‖ ‖	F.P.	—	80	65	Don Bros., Buist	75	...	b3.5	2.6	6.6	6.4
§14	F.P.	31/5	15	14	Edmond Hldgs. 10p	14	...	b1.0	1.1	10.2	12.7
§687	F.P.	—	625	595	Int'l Income Property	615	...	Q60c	—	8.7	—
‖ ‖	F.P.	—	60	34	✠IntervisionVideo10p	43	+6	1.0	2.1	3.3	17.0
§80	F.P.	20/5	135	110	✠Lorlin Elect. 20p	117	...	b1.0	5.0	1.2	19.5
§32	F.P.	10/5	43½	38½	MCD	40	...	u1.0	2.3	3.6	18.5
§70	F.P.	15/6	82	75	✠Mellerware 10p	79	+1	u2.52	2.3	4.6	13.5
240	F.P.	—	380	260	✠Micro Focus 10p	288	+18	—	—	—	44.3
§94	F.P.	20/5	155	140	✠Microlease 10p	150	...	ud2.0	2.6	1.9	24.3
§60	F.P.	27/5	143	113	✠Miss World Grp. 10p	113	...	b3.0	2.5	3.8	15.3
¶¶65	F.P.	16/5	83	60	✠Mnemos 10	60		—	—	—	—
¶350	F.P.	27/5	368	348	Octopus Publish. 20p	358	+5	;8.0	2.3	3.2	18.9
§£48	F.P.	—	£67	£57	Perstorp AB Free 'B'	£57	−1	9.84%	5.2	0.8	25.2
‖ ‖	F.P.	—	37	27	✠Rivlin I. D. & S. 5p	35	...	Q F0.1	—	0.4	—
§134	F.P.	27/5	150	130	✠Securiguard 5p	130		b1.75	2.6	1.9	28.1
§105	F.P.	10/6	150	120	✠Spring Ram 10p	122		u3.0	2.8	3.5	14.3
§47	F.P.	3/6	80	63	✠Strikes Rests. 10p	64	...	g1.35	3.5	3.0	13.4
¶¶	F.P.	—	28	25	Throgmort'n Tst. Wtnt.	28		—	—	—	—

FIXED INTEREST STOCKS

Issue price £	Amount paid up	Latest Renunc. date	1983 High	1983 Low	Stock	Closing price	+ or −
¶¶100p	F.P.	18/52	120p	100p	✠Booth 10% Con. Uns. Ln. 1990	105p	......
—	£20	28/10	20½	19¼	Bristol 11½% Red. 2016	19¾	......
—	£25	26/8	26	23¼	Bruxton Est. 11½% Deb	23¾	......
¶101	£10pd.	—	10¾	9¾	East Anglia Water 7% Red. Pref. 1988	10	+¼
‖100p	F.P.	12/5	117p	110p	East'n Prod. 10% Con. Ln. 1997-2002	110p	......
¶101	£10	28/7	12	11	Folkestone Water 7% Pref. 1988	11	......
—	—	—	100⅛	99	Nationwide B. S. 10% Bds. 30/4/84	99	......
§100	£25	7/7	23	21½	N'castle&G'headWater11½%RdDb2004	21½	−½
¶¶	F.P.	24/6	102	99¾	NewThrogm't'n Tst. (83) 12.6% 2008	100¾	......
93.89	£30	15/9	30½	29½	New Zealand 11¼% 2008	29⅝	−⅛
¶101	£10pd	—	10	9¾	North Surrey Wtr. 7% Red. Pref. 1988	10	+¼
99.785	F.P.	17/6	101½	99	Securities Tst of Scot. 12% 2005	99	......
¶¶	F.P.	—	101½	100½	Throgmorton Tst. 12% Deb. 2010	101½	......
‖	F.P.	12/5	112p	96½p	Tomatin Dist. 7% Cnv. Pref.	100p	......
§98.579	£25	31/8	24	22½	Trafford Park Est. 11½% 2007-11	22½	......
§99.898	£25pd	—	26	26	Watn'yM'nn&Trum'n12% Red.Deb.2008	26	......
100p	F.P.	15/5	112p	104p	Wellman Eng. 10% Irr. Pref.	104p	......

"RIGHTS" OFFERS

Issue price	Amount paid up	Latest Renunc. date ●	Latest Renunc. date ■	1983 High	1983 Low	Stock	Closing price	+ or −
35	F.P.	20/5	17/6	49	37	Anvil Pet. 20p	37	−3
£I.R.6.80	Nil pd	—	—	7½pm	2pm	‡‡Atlantic Res.	2pm	−5
A$1.50	20cents	—	—	81pm	81pm	Bridge Oil.	81pm	...
A$3.80	Nil	—	—	85pm	73pm	CRA	80pm	...
42	F.P.	—	6/6	58	35	Combined Tech. 10p	35	−2
85	F.P.	—	3/6	124	121	Dubilier 5p	122	+1
135	F.P.	—	17/6	150	144	EIS	146	−2
14	F.P.	19/5	31/5	15½	13½	Edmond Hlds. 10p	14	...
155	F.P.	—	10/6	213	191	Electro Protective $0.05	200	−8
145	F.P.	23/5	1/6	166	153	GKN £1	156	...
146	Nil	—	22/6	11pm	6pm	Hawley Grp.	6pm	−5
100	Nil	—	17/6	60pm	34pm	Mellins 5p	52pm	−4
290	F.P.	6/5	10/6	365	345	Mills & Allen	350	...
45	Nil	—	—	2pm	2pm	Myson Group 10p	2pm	...
1.25	Nil	13/5	24/6	20pm	14pm	Norton (W.E.) 1p	19pm	−1
150	Nil	—	17/6	12½pm	10pm	Rightwise 10p	10pm	...
—	F.P.	6/5	3/6	34	15½	Sheffield Brick	33	...
178	Nil	—	21/6	24pm	6pm	Spirax-Sarco	8pm	...
390	F.P.	—	10/6	455	430	Standard Chartered Bank £1	455	+12
140	F.P.	—	—	280	245	Warehouse Gp.	280	...

Renunciation date usually last day for dealing free of stamp duty. *b* Figures based on prospectus estimates. *d* Dividend rate paid or payable on part of capital; cover based on dividend on full capital. *g* Assumed dividend and yield. *u* Forecast dividend: cover based on previous year's earnings. F Dividend and yield based on prospectus or other official estimates for 1983-84. Q Gross. ‡ *Cover allows for conversion of shares not now ranking for dividend or ranking only for restricted dividends.* ● Figures or report awaited. § Placing price. *p* Pence unless otherwise indicated. ¶ Issued by tender. ‖ Offered to holders of ordinary shares as a "rights." ** Issued by way of capitalisation. §§ Reintroduced. ¶¶ Issued in connection with reorganisation merger or take-over. ‖‖ Introduction. □ Issued to former preference holders. ■ Allotment letters (or fully-paid). ● Provisional or partly-paid allotment letters. ★ With warrants. ‡ Effective issue price after scrip. † Formerly dealt in under special rule.

PENDING DIVIDENDS

Dates when some of the more important company dividend statements may be expected in the next few weeks are given in the following table. The dates shown are those of last year's announcements except where the forthcoming board meetings (indicated thus*) have been officially notified. Dividends to be declared will not necessarily be at the amounts in the column headed "Announcement last year."

	Date	Announcement last year
*AE	[illegible]	Interim 0.8
*AB Foods	May 23	Final 2.9
*Allied Irish Bank	May 25	Final 5
*Allied Lyons	June 1	Final 3.5
*Anglo Am. Cpn. of SA	June 1	Final 75c
*Aust and NZ Banking	May 23	Interim 14c
*Avana	June 21	Final 3.6
*Avon Rubber	May 25	Interim 1
BPB	June 30	Final 6.0
Baker Perkins	June 24	Final 3.0
*Bass	May 25	Interim 2.66
Beecham	June 3	Final 4.3
*Boots	May 25	Final 5 625
Brit. and Com. Shipping	June 17	Final 7.5
*Brockhouse	May 26	Interim nil
Burnett & Hallamshire	June 22	Final 7.5
*Capital and Cnties. Prop.	May 25	Final 2.6
Carless Capel	June 9	Final 2 5
Cater Allen	May 25	Final due
Chloride	June 18	Final nil
*Coalite	June 1	Final 3.1
Common Bros	May 19	Interim 1.429
*De La Rue	June 1	Final 15 48
*Dobson Park	June 3	Interim 1.9
Eastern Produce	June 4	Final 3.22
Electro-components	June 28	Final 1.35
Electronic Rentals	June 3	Final 3.143
*Elliott (B.)	June 9	Final nil
Eng. China Clays	June 17	Interim 3.0
Ferguson Industrial	June 14	Final 3.5
Ferranti	June 23	Final 5 5
GEC	July 1	Final 8 5
GEI Intl.	June 22	Final 3.555
Great Portland Ests	June 9	Final 4.0
Guinness (A.)	June 15	Interim 1.575
Hambros	June 22	Final 37.5
Harrisons and Crosfield	June 2	Final 20.5
Hickson and Welch	June 3	Interim 2.5
ICI	July 28	Interim 9.0
*ICL	June 7	Interim nil
*Inchcape	May 24	Final 11.0
Johnson Firth Brown	June 11	Interim nil
Johnson Matthey	June 16	Final 7.0
Kenning Motor	June 14	Interim 1.75
*London and Northern	May 25	Final 1.35
Lond and O'seas Freighters	June 18	Final nil
*Metal Box	June 13	Final 6.51
Mountview Ests	June 3	Final 2 5
Muirhead	June 15	Interim 2 0
Norcros	June 28	Final 3.92
*Northern Foods	June 22	Interim 2.0
Pauls and Whites	June 17	Final 5.25
Pegler-Hattersley	June 5	Final due
*Pilkington Bros	June 10	Sec. int. 5 5
*Plessey	May 26	Final 5.073
Powell Duffryn	June 23	Final 9.55
*RHM	May 24	Interim 1.524
RHP	May 27	Interim 2
Racal Elec.	June 23	Final 3.4
Redland	June 24	Final 4.67
Samuel (H.)	May 26	Final 4.75
Scottish and Nwcstle Brws	July 1	Final 2 875
*600 Group	June 9	Final 2.91
Sketchley	June 8	Final 7.3
Stood and Simpson	July 1	Final 2 85
Tate & Lyle	May 26	Interim 4
Tesco Stores	June 16	Final 1.9
Tozer Kemsley and Millbourn	Apr 17	Final 0.3
Trusthouse Forte	June 24	Interim 1.5
UBM	June 3	Final 1
Westland	June 9	Interim 2.75

* Board meeting intimated. † Rights issue since made. ‡ Tax free. § Scrip issue since made. ¶ Forecast.

This document includes particulars given in compliance with the Regulations of the Council of The Stock Exchange for the purpose of giving information to the public with regard to Channel Islands Transatlantic Investment Funds Limited ("CITIFUNDS" or the "Company"). The Directors have taken all reasonable care to ensure that the facts stated herein are true and accurate in all material respects and that there are no other material facts the omission of which would make misleading any statement herein, whether of fact or opinion. All the Directors accept responsibility accordingly.

Application has been made to the Council of The Stock Exchange for the Participating Shares of each class in the capital of the Company now being offered to be admitted to the Official list

A copy of this Prospectus and of the Application Form, having attached thereto the documents specified below, have been delivered to the Registrar of Companies in London for registration.

CHANNEL ISLANDS TRANSATLANTIC INVESTMENT FUNDS LIMITED

A company incorporated with limited liability in Jersey as an investment company on 27th April, 1983 under the provisions of the Companies (Jersey) Laws 1861 to 1968.

CITIFUNDS

MANAGED BY CITIBANK (CHANNEL ISLANDS) LIMITED

Initial offer for subscription of up to 60,000,000 Participating Redeemable Preference Shares of U.S.1 cent each ("Participating Shares") of the following classes and at the prices respectively specified, payable in full on application:—

CLASS	PRICE PER PARTICIPATING SHARE
Deutschemark Shares	DM 20
Japanese Yen Shares	Y 2000
Sterling Shares	£ 5
Swiss Franc Shares	SwFr 20
United States Dollar Shares	U.S.$10
Managed Shares	U.S.$10

SHARE CAPITAL

Authorised U.S.$		*Issued and to be issued fully paid U.S.$*
100	in Founders Shares of U.S.$1 each	100
600,000	in Unclassified Shares of U.S. 1 cent each	up to 600,000

The Subscription lists for this initial offer of Participating Shares will open at 9.00 a.m. (Jersey time) on Monday, 6th June, 1983 and will close at 10.00 a.m. (Jersey time) the same day.

Directors:
John Alfred Bennett,
Managing Director of Citibank (Channel Islands) Limited, Jersey, Channel Islands.
John Chester Botts,
Managing Director of Citicorp International Bank Limited, London, England.
Ronald David Corwin,
Managing Director of Famibank S.A., Brussels, Belgium.
Jean-Pierre Cuoni,
Chairman of Citicorp Bank Switzerland, Zurich, Switzerland.
Friedrich Wilhelm Menzel,
Managing Director of Citibank A.G., Frankfurt-am-Main, Federal Republic of Germany.
Francesco Redi,
Senior Vice President of Citibank, N.A. Paris, France.
Adolph John Zabick,
Senior Vice President of Citibank, N.A., London, England.
all c/o P.O. Box 104, St. Helier, Jersey, Channel Islands.

Registered Office:
Channel House, Green Street, St. Helier, Jersey, Channel Islands.

Managers, Registrars and Secretary:
Citibank (Channel Islands) Limited, Channel House, Green Street, St. Helier, Jersey, Channel Islands.

Investment Advisers:
Citibank, N.A., London branch, 336 Strand, London WC2R 1HB.

Bankers and Custodian:
Citibank, N.A., Jersey branch, Channel House, Green Street, St. Helier, Jersey, Channel Islands.

Auditors:
Peat Marwick, Mitchell & Co., Chartered Accountants, Equity & Law House, La Motte Street, St Helier, Jersey, Channel Islands.

Stockbrokers:
W. Greenwell & Co., Bow Bells House, Bread Street, London EC4M 9EL.

Legal Advisers:
In Jersey: Bedell & Cristin, Normandy House, St. Helier, Jersey, Channel Islands.
In England: Coward Chance, Royex House, Aldermanbury Square, London EC2V 7LD.

SUMMARY

This summary is qualified in its entirety by the fuller particulars set out below to which reference should be made.

CITIFUNDS:
The Company is an open-ended investment company incorporated in Jersey and by this Prospectus is offering up to 60,000,000 Participating Redeemable Preference Shares of U.S. 1 cent each, which will be issued in registered form. Application has been made for the Participating Shares of each class to be admitted to listing on The Stock Exchange in London.

Currency Funds:
Investors will be able to invest in any one or more of the following five currencies:

Deutschemark
Japanese Yen
Sterling
Swiss Franc
United States Dollar

Each currency will have its own Currency Fund and an investment in the Currency Fund selected by the investor will take the form of an investment in Participating Shares of the class related to that Currency Fund.

Each Currency Fund is to be managed entirely separately and independently from every other Currency Fund. The minimum subscription to the Currency Funds is:–

U.S.$5,000
DM 10,000 Y1,250,000
£3,000 SwFr 10,000

Managed Fund:
Separately from the five Currency Funds, investors may invest in Participating Shares in the Managed Fund in which the Managers select on a discretionary basis the currency or currencies in which investments are denominated. Investors should be aware that the value of the Participating Shares in the Managed Fund may fall as well as rise.

Participating Shares of the Managed Fund will be denominated in U.S. dollars. The minimum initial subscription in the Managed Fund is U.S.$5,000.

Objectives:
CITIFUNDS will provide a professionally managed investment in the currency or currencies of the investor's choice, yielding a money market rate of return combined with low risk, ready availability of funds and the ability to switch between each Fund.

Investment Policy:
Each Fund will be managed within prudential and conservative guidelines as to the liquidity and quality of the investments held. Investments of the Currency Funds will be made and maintained so as to avoid foreign exchange risk.

Allotment and Redemption of Shares:
Participating Shares may be applied for on any Dealing Day and, subject to two days' prior notice, may be redeemed on any Dealing Day. Settlement will normally take place two business days after the relevant Dealing Day.

Conversion of Shares:
Shareholders can elect to switch all or part of their investment in one Fund to an investment in another Fund by converting their holding of Participating Shares of one class into Participating Shares of another class.

Special Arrangements:
Investors, particularly those with substantial funds at disposal, may prefer to take advantage of a simplified procedure under which they elect to have their Participating Shares registered in the name of the Custodian, who will on their behalf hold the share certificate(s) and execute the investor's telexed instructions as to conversion and/or redemption. The required procedure on subscription is set out in Application Procedure below. Arrangements as to conversion and redemption can be obtained by direct application to the Custodian: Telephone Jersey (0534) 70334 and Telex 4192436.

Share Prices and Valuations:
Participating Shares have a nominal value of U.S. 1 cent each. Following this initial issue, which is at the subscription prices specified above, each class of Participating Shares will be valued by reference to the underlying net asset value of the relevant Fund. In normal circumstances, the subscription and redemption prices of Participating Shares of a Fund on any Dealing Day will be the same.

No dividends will be payable on the Participating Shares. All income will be accumulated in the appropriate Fund and share prices will be calculated to reflect each day's accrued income.

The share prices for each Fund will be published daily in the London edition of the Financial Times and can be obtained during business hours by reference to the Managers.

Charges:
No charges will be made by the Company to an investor on subscription for, or redemption of, or conversion into Participating Shares in the Currency Funds. Subscriptions for or conversions into Participating Shares in the Managed Fund of less than U.S. $10,000 will be subject to an initial charge of 2½% of the amount invested.

Fees:
The Managers and the Custodian will receive monthly for their services to the Currency Funds a fee at the rate of ⅜ per cent. per annum and ⅛ per cent. per annum respectively calculated on the average daily net asset value of each Currency Fund.

The Managers and the Custodian will receive monthly for their services to the Managed Fund a fee at the rate of 1¼ per cent. per annum and ¼ per cent. per annum respectively calculated on the average daily net asset value of the Managed Fund.

No person receiving in any territory (other than the United Kingdom) a copy of this Prospectus and/or Application Form may treat the same as constituting an invitation or offer to him nor should he in any event use such Application Form unless in the relevant territory such an invitation or offer could lawfully be made to him without compliance with any registration or other legal requirements. It is the responsibility of any person outside the United Kingdom wishing to take up any entitlement or to make an application hereunder to satisfy himself as to full observance of the laws of the relevant territory in connection therewith, including the obtaining of any government or other consents which may be required, the satisfaction of any other formalities needing to be observed and the payment of any issuance, transfer or other taxes requiring to be paid in such territory.

No person has been authorised to give any information or to make any representations (other than those contained in this Prospectus) in connection with the issue and sale of the Participating Shares and, if given or made, such information or representations must not be relied upon as having been authorised by the Company. Neither the delivery of this Prospectus nor any issue or sale made hereunder shall, under any circumstances, create any implication that there has been no change in the affairs of the Company since the date hereof.

The Participating Shares have not been registered under the United States Securities Act of 1933 and, except in a transaction which does not violate the United States securities laws, may not be directly or indirectly offered or sold in the United States of America (including its possessions, its territories and all areas subject to its jurisdiction) or to or for the benefit of U.S. persons (being nationals, citizens or residents thereof or corporations organised under the laws of the United States of America) or to others purchasing the Participating Shares for re-offering, re-sale or delivery, directly or indirectly, in the United States, or to or for the benefit of any such persons.

Prospective shareholders should be aware that the Participating Shares do not represent a direct obligation of Citicorp, of Citibank, N.A. or of their respective branches or subsidiaries.

The consent of the Finance and Economics Committee of the States of Jersey under the Control of Borrowing (Jersey) Order 1958 (as amended) has been obtained to this issue. It must be distinctly understood that, in giving this consent, the Finance and Economics Committee takes no responsibility for the financial soundness of any schemes or for the correctness of any of the statements made or opinions expressed with regard to them.

All references herein to: (i) "£" are to the currency of the United Kingdom; (ii) "U.S.$" and "U.S. Dollars" and "U.S. cents" are to the currency of the United States of America; (iii) "Y" and "Yen" are to the currency of Japan; (iv) "SwFr." and "Swiss Franc" are to the currency of Switzerland; and (v) "DM" and "Deutschemark" are to the currency of the Federal Republic of Germany.

"Dealing Day" means any day that is a business day in Jersey; "Settlement Day" means the day for settlement of the relevant transaction in accordance with Eurocurrency market practice and will normally be two business days after the relevant Dealing Day; and "Funds" means the Currency Funds and the Managed Fund.

For all purposes of this Prospectus, a business day in Jersey shall be deemed to run from 10.00 a.m. (Jersey time) on the one business day until 10.00 a.m. (Jersey time) on the immediately succeeding business day.

CITIFUNDS

The Company was incorporated in Jersey on 27th April, 1983 with limited liability as an open-ended investment company. It has an authorised share capital of U.S.$600,100 divided into 100 Founders shares of U.S.$1 each and 60,000,000 Unclassified shares of U.S. 1 cent each. All of the Founders shares are owned by Citibank (Channel Islands) Limited.

The Company will issue and redeem Participating Shares designated in the currency of each Fund. The Company is authorised to issue up to 60,000,000 Participating Shares which, following this initial offer, are to be issued (and redeemed) at a price related to the underlying net asset value of the relevant Fund on any Dealing Day.

Each Fund will be maintained by the Company on a separate and identifiable basis from every other Fund. Investors select the currency in which they wish to invest and invest by subscribing for Participating Shares of the relevant class. Investors may switch all or part of their investment from one Fund to another Fund by converting all or part of their holding of Participating Shares of one class into Participating Shares of the other class. Investors may subscribe, convert and redeem Participating Shares on any Dealing Day. The Directors have power under the Company's constitution to introduce Currency Funds denominated in other currencies.

Separately from the five Currency Funds, investors may invest in Participating Shares in a Managed Fund in which the Managers select on a discretionary basis the currency or currencies in which investments are denominated. Participating Shares of the Managed Fund will be denominated in U.S. dollars, but will comprise a separate class of share from the Participating Shares of the United States Dollar Currency Fund.

MANAGERS, REGISTRARS AND SECRETARY

Citibank (Channel Islands) Limited is incorporated and resident in Jersey and will be responsible for implementing the investment policy of the Company, as laid down by the Board of Directors, as well as being responsible for the administration of the Currency Funds and the Managed Fund. It will act as Registrar and Secretary to the Company.

INVESTMENT ADVISERS

Citibank, N.A., through its London branch, will act as the investment advisers to the Managers. As investment advisers Citibank, N.A. will make recommendations to the Managers upon investment and keep these investments under regular review. Citibank, N.A. has funds in excess of U.S.$19 billion under discretionary management for its clients worldwide.

CUSTODIAN

[illegible]

APPOINTMENTS

Scottish Provident chief

SCOTTISH PROVIDENT has appointed Mr Gerald H. Elliot chairman in succession to Mr James A. Lumsden. Mr Elliot is chairman of Christian Salvesen and chairman of the Scottish Arts Council. Mr Elliot's successor as deputy chairman is Professor Ian G. Stewart, Professor of Economics at the University of Edinburgh.

★

Mr N. Colker, president of Accounting Corp. of America, has been made a director of AIDS COMPUTER SERVICES and AIDS (FRANCHISING).

★

Mr G. Michael Hostage, chairman, *president and chief executive* officer of Howard Johnson Company, U.S., has been appointed to the IMPERIAL GROUP board.

★

Mr *Walter* C. T. Crosby, general manager (trustee and investment) is to retire from the ROYAL BANK OF SCOTLAND on May 30. Taking over as general manager (trustee and investment) is Mr Donald A. Cameron, who was previously secretary of the bank. Mr Cameron joined the bank in 1949.

★

Mr Peter Dellar has been appointed to the board of CHARLES BAYNES. He was chairman of St Georges Laundry and has recently acquired a 30 per cent interest in Charles *Baynes, and is making* a full offer.

★

The board of BERISFORDS has been reconstituted following acquisition of British Trimmings (Holdings): Mr D. R. B. Mynors, chairman; Mr S. J. Sebire, deputy chairman and joint managing director; Mr A. W. Laughton, joint managing director; *and* Mr *R. G. H. Fielding*, Mr T. Plenderleith, Mr A. Rosenblatt and Mr A. F. Sebire as directors. Mr J. F. Sebire has retired from the board but continues as honorary president.

★

Mr Huw Manton has been appointed a director and general manager of BARCLAYS BANK INTERNATIONAL in place of *Mr Laurie Cockburn who is* retiring on September 28 after 43 years' service with Martins Bank and the Barclays Group. Mr Peter Cawsey, divisional general manager of Barclays Bank International's management services department, will succeed Mr Manton as a regional general manager.

★

Mr Nicholas Rostkowski, vice president of the Chase Manhattan Bank and executive director of Chase Manhattan Limited, will join the SKANDINAVISKA ENSKILDA BANKEN GROUP in July. He will become director and member of the board of Enskilda Securities in London and will be the head of the representative office of Skandinaviska Enskilda Banken in Paris.

★

Mr Brian Eyers has been appointed sales and marketing director for BOSTIK. Previously he was head of the DIY division of Berger Paints for six years.

★

Mr John Campbell has been appointed deputy chairman of ANGLO AMERICAN AGRICULTURE. *He has been a director* of Noble Grossart since 1973 during which time he has had a close involvement in the international plantation sector. He was managing director of McLeod Russel from 1979 to 1982 and is a director of Beradin Holdings which owns and manages oil palm and rubber estates in Malaysia. Mr William Sayre who has also joined the Anglo American Agriculture board, is a vice president of Continental Illinois Bank and Trust Company where he heads the agricultural property management division.

★

Mr C. R. Gray becomes deputy chairman of DUPORT. Mr C. I. Cooke has been appointed to the board. Mr Cooke is chairman and managing director of Duport Harper Foundries and is chairman of the companies comprising the Group's computing interests.

★

Mr N. O. Taube has joined the board of PRECIOUS METALS TRUST.

★

Senior appointments have been made by TSB SCOTLAND, which is to be launched on May 21 following the merger of the four present TSB's—Aberdeen, South of Scotland, Tayside and Central Scotland, and West of Scotland. Mr Anthony B. Davidson has been appointed general manager—special duties, from his post as general manager of *the TSB of Tayside and Central* Scotland. Mr David A. McLean has been appointed general manager—retail operations, from his present position as deputy general manager of the West of Scotland TSB. Appointed area general manager west, is Mr James H. Chapman, from Paisley. He was assistant general manager (personnel) for West *of Scotland TSB*.

★

BRABY ECONOMIC APPLIANCES has appointed Mr D. A. Hopkins national sales director.

★

Mr Terry Stewart has been appointed managing director of ELSENHAM QUALITY FOODS. He joins from Sheaffer pens where he was managing director. Mr Tony Blunt is retiring to concentrate on his other business activities, but will continue to act as a consultant. Elsenham is a James Burrough company.

★

Mrs Elizabeth Wood has joined the partnership of GREENE & CO., stockbrokers.

★

AM INTERNATIONAL (HOLDINGS), a subsidiary of AM International Inc, U.S., has appointed general managers for each of its three divisions in the U.K. Mr David Sear, director of sales and marketing has been promoted to general manager of the largest division — Multigraphics. Mr Alan Senior moves from general manager of AM Varityper UK to general manager of Admel division. Mr Lawrence Wallis, director of product support, has been promoted to general manager of AM Varityper UK.

★

BRIGHTON MARINA COMPANY chairman, Mr Humphrey Tilling, and its managing director, Mr John Perkins, will retire in June. Mr Tilling will be succeeded by the deputy chairman, Sir Kenneth Cork. Mr Perkins' successor will be Mr Peter Blackburn at present finance director.

★

Mr David Anslow, general manager of the agricultural division of Shell Chemicals UK is the new chairman of the BRITISH AGROCHEMICALS ASSOCIATION. New deputy *chairman is Mr Reg Norman*, managing director of Ciba-Geigy Agrochemicals.

★

Mr Graham L. Drake and Mr Keith R. Egerton have been appointed joint managing directors of COUNTY AND DISTRICT PROPERTIES and its subsidiaries. Mr Leslie W. Melville has relinquished the managing directorship but continues as chairman.

★

Dr E. S. Lennox of the Laboratory of Molecular Biology, Cambridge, and a recognised expert in the use of monoclonal antibodies in immunological research, has been appointed CELLTECH'S consultant director of immunology.

★

SAMUEL MONTAGU AND CO has appointed Mr David Dale an assistant director.

PLANT AND MACHINERY

Closing prices May 20

NEW YORK STOCK EXCHANGE COMPOSITE CLOSING PRICES

[illegible]

Continued on Page 27

AMERICAN STOCK EXCHANGE COMPOSITE CLOSING PRICES

Closing prices May 20

12 Month High	Low	Stock	Div.	Yld.	P/E	Sls 100s	High	Low	Close Quote	Ch'ge Prev. Close
[illegible]										

B–B–B

C–C–C

D–D–D

E–E–E

F–F–F

G–G–G

H–H–H

I–I–I

J–J–J

K–K–K

L–L–L

M–M–M

N–N–N

O–O–O

P–Q

Continued on Page 28

NEW YORK STOCK EXCHANGE COMPOSITE CLOSING PRICES

Continued from Page 26

12 Month High	Low	Stock	Div.	Yld.	P/E	Sls 100s	High	Low	Close Quote	Ch'ge Prev. Close
[illegible]										

O–O–O

P–Q

R–R–R

S–S–S

T–T–T

U–U–U

V–V–V

W–W–W

Continued on Page 28

Sales figures are unofficial. Yearly highs and lows reflect the previous 52 weeks plus the current week, but not the latest trading day. Where a split or stock dividend amounting to 25 per cent or more has been paid, the year's high-low range and dividend are shown for the new stock only. Unless otherwise noted, rates of dividends are annual disbursements based on the latest declaration.

a–dividend also extra(s). b–annual rate of dividend plus stock dividend. c–liquidating dividend. cld–called. d–new yearly low. e–dividend declared or paid in preceding 12 months. g–dividend in Canadian funds, subject to 15% non-residence tax. i–dividend declared after split-up or stock dividend. j–dividend paid this year, omitted, deferred, or no action taken at latest dividend meeting. k–dividend declared or paid this year, an accumulative issue with dividends in arrears. n–new issue in the past 52 weeks. The high-low range begins with the start of trading. nd–next day delivery. P/E–price-earnings ratio. r–dividend declared or paid in preceding 12 months, plus stock dividend. s–stock split. Dividends begins with date of split. sls–sales. t–dividend paid in stock in preceding 12 months, estimated cash value on ex-dividend or ex-distribution date. u–new yearly high. v–trading halted. vi–in bankruptcy or receivership or being reorganised under the Bankruptcy Act, or securities assumed by such companies. wd–when distributed. wi–when issued. ww–with warrants. x–ex-dividend or ex-rights. xdis–ex-distribution. xw–without warrants. y–ex-dividend and sales in full. yld–yield. z–sales in full.

WORLD STOCK MARKETS

Indices

NEW YORK — DOW JONES

	May 20	May 19	May 18	May 17	May 16	May 13	1983 High	1983 Low	Since Cmpil'n High	Since Cmpil'n Low
◆ Industr'ls	1190.02	1191.37	1203.56	1205.78	1202.56	1216.75	1232.59 (6/5)	1027.04 (3/1)	1232.59 (6/5/83)	41.22 (2/7/32)
H'me Bnds	75.51	75.92	76.09	76.54	76.71	77.29	77.84 (6/5)	70.78 (19/2)	—	—
Transport.	559.82	556.07	542.89	540.50	540.18	547.88	582.78 (6/5)	434.24 (3/1)	582.78 (6/5/83)	12.32 (8/7/32)
Utilities	128.88	128.74	129.48	129.45	128.78	129.61	129.84 (3/5)	118.51 (3/1)	163.32 (20/4/69)	10.5 (28/4/42)
Trading Vol 000†	73,150	85,280	88,780	79,510	76,250	83,110	—	—	—	—

◆ Day's high 1197.27 (1208.49) low 1179.08 (1186.15)

Indust'l div. yield %	May 13	May 6	April 29	Year ago (Approx)
	4.48	4.44	4.48	6.52

STANDARD AND POORS

	May 20	May 19	May 18	May 17	May 16	May 13	1983 High	1983 Low	Since Cmpil'n High	Since Cmpil'n Low
Indust'ls	181.77	181.58	183.04	183.73	183.40	185.01	186.37 (6/5)	154.95 (3/1)	186.37 (6/5/83)	3.62 (30/6/32)
Comp's'te	162.13	161.99	163.27	165.71	165.40	164.90	166.10 (6/5)	138.34 (3/1)	166.10 (6/5/83)	4.40 (1/6/32)

	May 18	May 11	May 4	Year ago (Approx)
‡Indust'l div. yield %	3.99	3.95	3.99	6.72
Indust'l P/E ratio	13.85	13.99	13.85	7.74
Long Gov. Bond yield	10.54	10.24	10.18	12.87

N.Y.S.E. ALL COMMON

May 20	May 19	May 18	May 17	1983 High	1983 Low
93.71	93.67	94.39	94.48	95.50 (10/5)	80.92 (24/1)

Rises and Falls

	May 20	May 19	May 18
Issues Traded	1,946	1,974	1,975
Rises	707	563	959
Falls	840	1,053	655
Unchanged	399	358	351
New Highs	84	112	205
New Lows	5	3	1

MONTREAL

	May 20	May 19	May 18	May 17	1983 High	1983 Low
Industrials	411.17	415.93	418.14	417.97	422.48 (13/5)	331.18 (4/1)
Combined	395.47	398.56	402.97	402.40	407.05 (10/5)	328.12 (4/1)
TORONTO Composite	2389.2	2402.1	2430.5	2424.7	2457.7 (10/5)	1949.8 (4/1)

NEW YORK ACTIVE STOCKS

Friday	Stocks traded	Closing price	Change on day		Stocks traded	Closing price	Change on day
ATT	1,473,500	65⅞	−⅛	Nat Semi	644,200	39¼	+1¼
Natomas	1,173,500	18½	+¼	Digital Equip	641,000	108½	−1
Mesa Trust	892,300	3½	+¼	Amer Motors	628,400	9	—
Southern	864,500	15⅞	—	Citicorp	622,300	40⅞	+1¼
Exxon	845,600	33½	+⅛	Penn Central	599,500	34⅞	−1

	May 20	May 19	May 18	May 17	1983 High	1983 Low
AUSTRALIA						
All Ord. (1/1/80)	609.0	607.5	608.6	602.5	618.4 (12/5)	487.8 (4/1)
Metals & Minls. (1/1/80)	545.2	541.4	549.6	535.2	565.8 (11/5)	411.8 (4/1)
AUSTRIA						
Credit Aktien (2/1/62)	57.76	57.80	57.56	57.80	58.8 (5/5)	48.49 (15/2)
BELGIUM						
Belgian SE (31/12/63)	122.04	121.37	121.97	122.14	122.86 (28/4)	100.50 (4/1)
DENMARK						
Copenhagen SE (3/1/83)	140.08	141.29	(u)	143.04	144.30 (11/5)	100.00 (3/1)
FRANCE						
CAC General (31/12/82)	123.8	124.7	124.6	124.5	128.1 (16/5)	96.1 (5/1)
Ind Tendance (31/12/82)	128.7	128.2	128.0	128.1	130.4 (15/5)	98.0 (5/1)
GERMANY						
FAZ-Aktien (31/12/58)	311.79	314.11	315.08	308.49	321.64 (29/4)	241.88 (25/1)
Commerzbank(Dec1953)	952.2	957.8	956.7	929.7	985.6 (27/4)	727.9 (26/1)
HONG KONG						
Hang Seng Bank (31/7/64)	942.05	926.22	933.46	930.70	1067.56 (14/4)	761.61 (4/1)
ITALY						
Banca Comm Ital.(1972)	182.68	182.76	180.29	180.54	214.85 (21/3)	160.45 (18/1)
JAPAN**						
Dow Average (16/5/49)	8561.45	8584.42	8588.84	8572.23	8719.88 (9/5)	7803.18 (25/1)
Tokyo New SE (4/1/68)	651.73	652.85	651.75	628.21	657.70 (9/5)	574.51 (25/1)
NETHERLANDS						
ANP-CBS General (1970)	123.4	124.1	126.8	126.4	131.0 (12/4)	100.1 (4/1)
ANP CBS Indust (1970)	101.5	102.4	103.9	105.0	108.2 (12/4)	83.5 (4/1)
NORWAY						
Oslo SE (4/1/83)	189.81	192.57	192.75	(c)	194.24 (16/5)	99.01 (4/1)
SINGAPORE						
Straits Times (1966)	939.13	936.40	947.60	951.87	988.46 (6/5)	712.28 (5/1)
SOUTH AFRICA						
Gold (1958)	945.8	968.4	985.3	967.5	1039.5 (1/2)	884.3 (28/3)
Industrial (1958)	961.8	960.2	953.0	946.5	961.6 (20/5)	740.9 (5/1)
SPAIN						
Madrid SE (31/12/82)	115.90	115.18	114.64	114.86	118.08 (13/4)	96.32 (11/1)
SWEDEN						
Jacobson & P. (1/1/58)	1456.25	1468.55	(c)	1484.28	1517.42 (16/5)	896.16 (5/1)
SWITZERLAND						
SwissBankCpn.(31/12/58)	324.8	325.3	326.7	325.0	330.4 (2/5)	294.4 (4/1)
WORLD						
Capital Intl. (1/1/70)	—	176.8	177.0	176.5	179.5 (9/5)	154.3 (5/1)

(**) Saturday May 14: Japan Dow 8,627.11. TSE 630.74.

Base values of all indices are 100 except Australia All Ordinary and Metals—500. NYSE All Common—50; Standard and Poors—10; and Toronto—1,000; the last named based on 1975. † Excluding bonds. ‡ 400 industrials. § 400 industrials plus 40 Utilities, 40 Financials and 20 Transports. c Closed. u Unavailable.

AUSTRIA

1983 High	1983 Low	May 20	Price %
220	206	Credit'stalt Pfd.	217
370	181	Goesser	327
379	358	Intersunfall	375
216	201	Laenderbank	214
400	255	Perimooser	374
179	148	Steyr Daimler	169
262	171	Veitscher Mag	252

BELGIUM/LUXEMBOURG

1983 High	1983 Low	May 20	Price Frs.
1,260	990	ARBED	1,094
3,950	3,700	Bank Int A Lux	3,850
2,700	2,100	Bekaert B	2,650
2,090	1,585	Ciment BR	2,030
130	86	Cockerill	106
4,300	3,660	Delhaize	3,810
2,525	1,875	EBES	2,240
5,950	4,460	Electrobel	5,660
2,900	2,500	Fabrique Nat	2,600
3,140	2,710	G.B. Inno	2,795
1,940	1,450	GBL (Brux)	1,940
2,260	1,740	Gevaert	2,050
4,835	3,600	Hoboken	4,750
1,920	1,724	Intercom	1,865
5,700	4,300	Kredietbank	5,700
8,150	4,300	Pan Hldgs	8,000
6,560	4,610	Petrofina	5,560
6,970	5,910	Royale Belge	6,880
2,840	2,305	Soc. Gen. Banq	2,700
1,750	1,200	Soc. Gen. Belge	1,670
5,000	3,755	Sofina	4,580
2,800	2,180	Solvay	2,700
3,410	2,645	Traction Elect	3,080
3,650	2,620	UCB	3,650
4,400	[illegible]	Vieille Mont	[illegible]

DENMARK

[illegible]

CANADA

1983 High	1983 Low	Stock	May 20
27⅛	18⅞	AMCA Intl	24¾
25¼	18¼	Abitibi	22¾
20⅜	16⅞	Agnico Eagle	20
17⅞	14¼	Alberta Energy	16⅞
41⅛	33⅛	Alcan Alumin	41⅛
33	24¾	Algoma Steel	31
13⅝	9½	Asbestos	11½
33⅜	25	Bk Montreal	30½
45⅞	32	Bk Nova Scotia	42
28	22½	Bell Canada	27¼
16½	13¼	Bombardier	14½
23½	16⅛	Bow Valley	23⅝
24¼	20	BP Canada Res.	24
32¼	19⅝	Brascan A	31¼
3.95	2.70	Brinco	3.75
13	8¼	B.C. Forest	12¾
29¾	25⅛	CIL Inc	29
10	8	CadillacFairview	9⅛
18⅛	12⅜	Can Cement	—
28½	22½	CanNW Energy	27½
42	35	Can Packers	42
46½	30½	Can Trustco	41
42	30	Can Imp Bank	36⅝
47⅞	35⅞	Can Pacific	45⅛
25	18	Can. Pac. Ents	23¼
65½	51	Can Tire	58
17¾	11⅜	Carling O'Kfe	15¼
25⅛	21	Chieftain	21¼
56½	44¾	Cominco	55½
23½	16	Cons Bathst A	22
5.00	2.96	Coseka Res	4.05

[illegible]

ITALY

1983 High	1983 Low	May 20	Price Lire
30,000	28,500	Banca Com'le	29,500
246	137.6	Bastogi IRBS	210.3
2,590	1,717	Centrale	1,801
6,100	3,639	Credito Varesino	4,951
2,972	1,635	Fiat	2,829
77	33.2	Finsider	55
135,500	104,125	Generale (Assic)	138,680
2,580	1,920	Invest	2,301
44,150	27,800	Italcementi	42,700
138.2	99	Montedison	135.2
2,921	1,901	Olivetti	2,790
3,000	2,315	Pirelli Co.	2,710
1,700	1,173	Pirelli Spa	1,563
999	571	Snia Viscosa	975
13,999	9,970	Toro Assic.	12,200
10,500	6,950	do. Pref	9,498

NETHERLANDS

1983 High	1983 Low	May 20	Price Fls
174.5	98	ACF Holding	145
173	125	Ahold	144.9
66.7	34.9	AKZO	58.4
367	295.0	ABN	356
125	100.0	AMEV	119
64.6	41.9	AMRO	56.2
200.0	143.5	Bredero Cert	183
52.5	29.0	Boskalis Westm.	44.8
46	30.5	Buhrmann-Tet	43.5
35.6	27.1	Caland Hldgs	29.8
325	190.0	Elsevier-NDU nv.	296

[illegible]

HONG KONG

1983 High	1983 Low	May 20	Price H.K.$
33.25	26.4	Bank East Asia	27.5
0.87	0.87	Carrian Invest.	0.87
10.9	5.95	Cheung Kong	8.125
15.3	12.2	China Light	13.8
3.05	6.68	Hang Lung Devel.	7.85
64.5	55.0	Hang Seng Bank	60.5
6.25	4.95	HK Electric	5.45
4.32	2.47	HK Kowloon Wh.	4.77
5.00	3.5	HK Land	4.05
8.77	6.45	HK Shanghai Bk.	7.95
38.75	28.5	HK Telephone	30.5
15.2	9.85	Hutchison Wpa	12.1
16.1	12.4	Jardine Math	14.4
3.75	2.19	New World Dev.	3.17
2.75	2.3	Orient O'seas	2.70
5.1	3.37	O'seas Trust Bk.	4.25
7.25	4.8	SKH Props.	5.7
14.2	8.15	Swire Pac A	12.8
4.10	2.82	Wheel'k Mard A.	3.2
2.40	1.77	Wheel'k Mar'til'e	2.15
1.79	1.21	World Int. Hldgs.	1.52

JAPAN

1983 High	1983 Low	May 20	Price Yen
900	805	Ajinomoto	815
2,500	1,610	Alps Electric	2,350
680	515	Amada	579
389	263	Asahi Chem	310
605	510	Asahi Glass	573

[illegible]

NORWAY

[illegible]

AUSTRALIA

[illegible]

SINGAPORE

[illegible]

SOUTH AFRICA

[illegible]

FRANCE

[illegible]

GERMANY

[illegible]

SWEDEN

[illegible]

SWITZERLAND

[illegible]

SPAIN

[illegible]

AMERICAN STOCK EXCHANGE CLOSING PRICES

Continued from Page 27

12 Month High	Low	Stock	Div.	Yld.	P/E	Sls 100s	High	Low	Close Quote	Ch'ge Prev. Close
11⅞	5⅛	Spark	pf 1	9.6		129	10⅜	10½	10⅜	−⅛
26⅞	5⅞	Spectro	s.14	6	17	105	23⅞	23	23	−½

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NEW YORK CLOSING PRICES

Continued from Page 27

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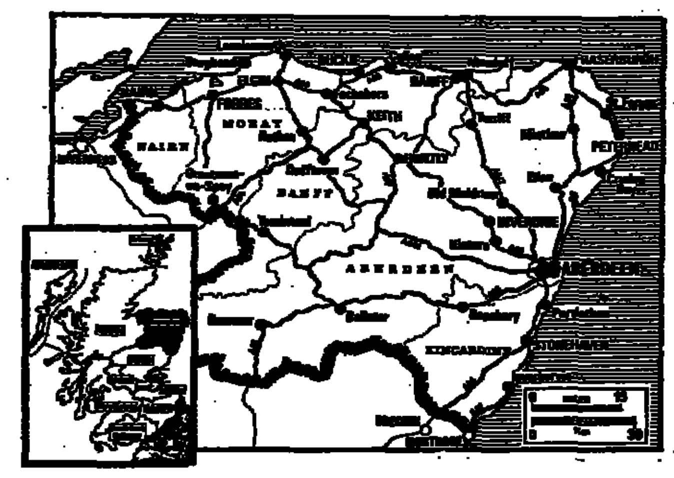
Aberdeen

Bright prospects for the Granite City



With the forecast of decades of offshore oil operations in the North Sea, the future of Aberdeen looks increasingly promising. This confidence is highlighted by plans for an international trade centre in the city to sell products and services to the world's offshore operators.

REPORT BY MARK MEREDITH
PICTURES: ROGER TAYLOR

ABERDEEN has never had it so good—and it looks as *though the ancient granite* city is about to have it even better.

The development of offshore oil fields over the last decades has brought a vast and highly technical industry to this city which had a relatively modest *past in fishing, textile, paper* and engineering.

The city today exudes a prosperity unlike any other in Scotland, based on an industry paying above average wages and now accounting for about 40,000 jobs.

Aberdeen has traditionally *had low unemployment and* presently this remains around the 7 per cent mark, compared with the 15.1 for Scotland and up to 24.1 per cent in industrial blackspots such as the Irvine area of the south-west.

The major oil corporations and their attendant array of companies feeding them services and equipment have had a profound effect on all areas of the city economy.

It seems that the crowds on Union Street, the main shopping area, show a similarity to London's Oxford Street during the sales.

The airport can give the visitor the first real feel of excitement for this new industry as squads of helicopters queue up in the early morning to take crews out to the offshore installations. The harbour throbs with supply boats, fishing vessels or ferries serving Orkney and Shetland.

In this city, international oil market and production forecasts are read as farmers might scrutinise the weather report. Fluctuations in the international fortunes of oil can influence new building decisions, a move by a new company seeking to a break into a highly competitive market, or a construction company's building programme for local housing.

While the boom-type growth of the 1970s may be over, industrialists in Aberdeen are confident there are decades of offshore operations ahead, as well as continued new explorations and the exploitation of marginal fields—all promising news for a city now very much dependent on oil and gas.

The budget proposals on oil has brought new encouragement for the offshore industry. The Chancellor's message relieved a number of grievances by oilmen and should spur new interest after a slack winter with little new activity.

The measure granted immediate relief against petroleum revenue tax for expenditure and appraisal activities, a doubling of oil allowance for future fields, an abolition of royalties on fields granted Government approval after April 1, 1982, progressive phasing out of the petroleum revenue tax in the period up to 1986 and tax relief on shared assets, such as pipelines.

These measures are expected to generate new moves into marginal oil fields off the Shetland Islands and in the deeper waters of the North Atlantic where a whole new generation of production technology will be needed.

But the lead times between the discovery of oil in a new field and new orders for equipment to bring it up commercially can take months or even years.

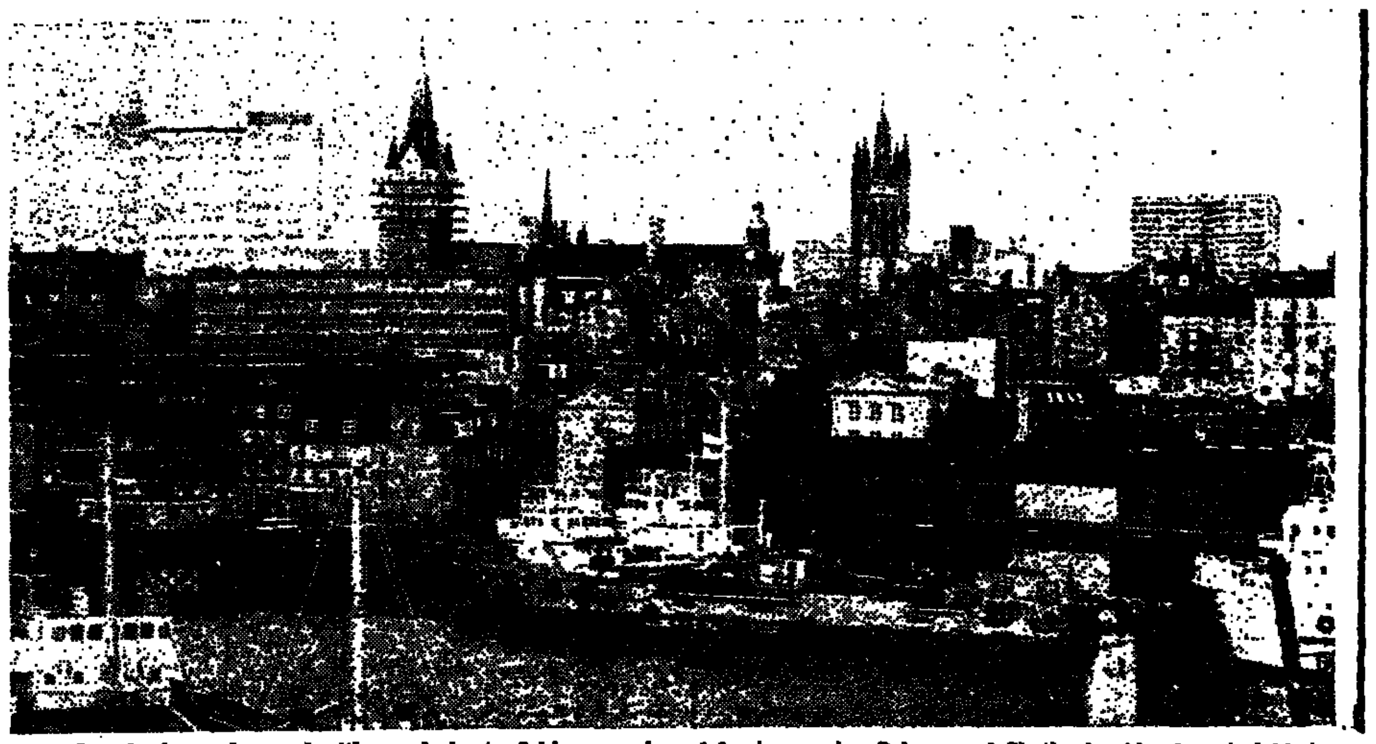
In the meantime support services for the 20 offshore fields presently in production and others in early development *continues to provide business* for Aberdeen.

In the coming year, the city will see a fundamental development in the history of the offshore industry.

Leading figures from the private sector have proposed the construction of a trade centre in the city to act as a market place for British companies trying to sell products and services to international offshore operators.

The significance of the centre is that it is aimed at correcting an imbalance of UK to foreign groups, which are active offshore. The North Sea required the know-how and resources of the American oilmen. But, to date, there are many areas of technology and service where British companies have yet to make their mark.

The trade centre would operate on a commercial basis, offering consultative services, such as marketing advice to help new companies penetrate a difficult market—one where mistakes and lost time cost hundreds of thousands of pounds.



Aberdeen harbour, thronged with supply boats, fishing vessels and ferries serving Orkney and Shetland. Aberdeen is lobbying vigorously for "free port" status which would provide a further stimulus for the oil industry

According to estimates in a joint study by the Scottish Development Agency (SDA) and the North East of Scotland Development Authority (*NESDA*) which *is* part *of* Grampian Regional Council, spending offshore this year on exploration, development and operations will be around £3.5bn, rising to over £6bn in 1986.

According to current estimates from the Government's Offshore Supplies Office, 73 per cent of the contracts for the £2.26bn spent by the offshore operators in 1982 went to British companies. But this figure in*cludes* UK *subsidiaries of* American companies, many of them based in Aberdeen.

Another important development in the coming year could be the Government decision on a free port. Aberdeen has lobbied vigorously for the nomination feeling it would provide *yet further stimulus for the oil* industry.

According to backers of the free port concept, part of the freeport could be around Dyce Airport and the rest near the harbour to cater for the different types and size of offshore exported equipment.

The Scottish Development Agency has plans to develop a science park joined to the University of Aberdeen which could supply a new focal point for high technology industries with offshore applications.

For a city in the midst of Britain's largest industrial revenue maker, the city of *Aberdeen has been easy to neg*lect in terms of the attentions of development bodies.

Industrial decline has blighted much of Scotland, calling on the full resources of bodies such as the Scottish Development Agency, which has a low profile in Aberdeen.

But the traditional industries of this city such as textiles, fish processing, paper and engineering have been severely damaged during the build up of offshore interest.

These manufacturing industries have declined at a rate similar to that of Strathclyde in the heavily industrialised west of Scotland.

A oil and non-oil economy has been created leading the region to resist strongly the Government decision to remove assisted area status for most of Grampian and hence remove grants and other benefits to incoming industries in the manufacturing sector.

New inward investment in non-oil industries is now unlikely. But a development study for the city recommended greater attention on industrial diversification, especially in the area of microelectronics which has good potential applications to offshore work.

Aberdeen throughout *this* past decade has kept its grey granite character and the centre of town has not been totally overtaken by new developments. The offices and the indsutrial estates cluster like satellites around the periphery of the city.

Aberdeen lacks the *layer of* industrial soot of big cities reflecting the modest size of its traditional industries.

In the field of office and commercial property, the day is past when the oil majors will gobble up huge chunks of space and more smaller units are in demand. *The four-year supply* of space now available is a worry to property men.

New operators may, however, appear on the scene with future rounds of licences and they will require headquarters and staff. They will also buy at the local shops, fly from the airport and add *further to the prosperity of* a small and ancient city which now enjoys a relative economic "high."

Support services for 20 offshore oil fields provide big business for Aberdeen

New projects in marginal oilfields will boost Aberdeen's oil-dominated economy

44,000 oil workers now based in the region

OIL has taken over the Aberdeen economy. An estimated 44,000 workers in the Grampian region are in oil-related employment, 95 per cent of whom are based in Aberdeen. The city itself is small with a population of 212,000.

The very strength of the oil economy has to a certain extent formed a dual economy with a lower category of wages costs and for the traditional non-oil industries.

Aberdeen watches key national and international factors affecting oil production as a weathervane to the city economy. Official surveys of the economy for the surrounding region usually include a review of forecasts for further oil development.

The Government's tax structure and low oil prices have made this a comparatively cold winter for Aberdeen, although many other cities in Scotland and the rest of the UK would dearly welcome an economic climate such as this.

Uncertainty

But reduction of offshore work quickly spreads onshore to the industries downstream. Supply boats wait for new contracts tied up in the harbour. House prices move uncertainly.

The budget stimulus to oil is seen as opening a new era of development with new drillings and exploration in marginal fields and a host of eagerly awaited service contracts.

The Quarterly Economic Journal of the Grampian region, which surrounds Aberdeen, points out other benefits for the economy in enhanced consumer demand from the raising of personal tax thresholds.

However vigorous the stimulus from the Government, downstream industries remain aware of the long lead times involved before contracts percolate down from the offshore operators.

A year or more can lapse from the time an oil company starts to drill to the time it decides to develop a field for full production.

But in the background of planners and the Government is the multiplier effect the offshore industry has — one job offshore means about two jobs onshore.

Training

In 1982, the oil majors employed nearly 9,000 people in Grampian and according to interviews conducted with the companies in the region's department of physical planning, employment in 1986 could rise to 10,970 and by 1991 to 13,260.

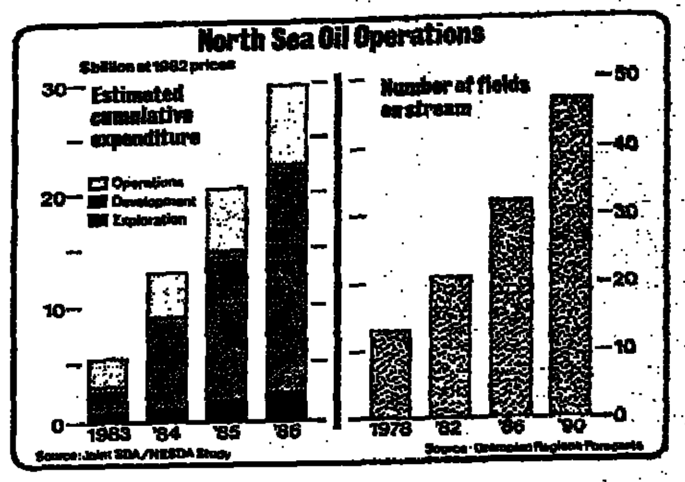
In March, the Manpower Services Commission published an in-depth study of the manpower needs in the region and noted that skill shortages had eased although demand would grow over the next five years.

The report urged a greater attention to training for specialist and technician skills if shortages are to be avoided in future.

The report forecast that employment of craftsmen and technicians would expand at twice the rate of total employment.

Occupations such as electrical and electronic technicians, instrument technicians, and instrument mechanics are much in demand and nearly 30 per cent of the companies interviewed by the Manpower Services Commission anticipate trouble in recruiting.

A feature of the growth decade for North Sea oil has been the increase in British personnel in all aspects of onshore and offshore work and there should be no shortage of personnel to carry out the most sophisticated work, according to Aberdeen industrialists.



INVESTMENT IN THE OIL INDUSTRY

Estimates (in $bn at 1982 prices) by the Scottish Development Agency and the North-East Scotland Development Authority of investment in oil-related activities

	1983	1984	1985	1986
Exploration:				
Surveying	0.045	0.063	0.065	0.077
Exploration appraisal	0.634	0.563	0.546	0.528
Development:				
Production platforms	1.353	2.987	2.893	3.629
Installation gas	0.324	0.102	0.290	0.465
Plant and equipment	0.151	0.759	0.607	0.908
Submarine pipelines	0.041	—	—	—
Development drilling	0.399	0.308	0.317	0.352
Terminals	0.822	1.08	1.272	1.382
Operating:				
Maintenance	0.290	0.299	0.310	0.341
Transport	0.576	0.588	0.607	0.674
Diving services	0.174	0.178	0.183	0.204
Drilling services	0.387	0.398	0.408	0.452
Offshore support	0.185	0.178	0.185	0.222
Miscellaneous	0.213	0.220	0.225	0.250
Totals	5.494	7.733	7.297	9.428

Traffic soars at the world's largest heliport

THE TIME: 7 am. The place: Aberdeen Airport, where a scene in the drama of North Sea oil development is beginning to unfold.

On the tarmac are ten or more helicopters, their rotor blades whirling as permission is awaited to fly-out crews to offshore oil platforms, exploration rigs or drill-ships.

The helicopters, for safety reasons, hover at the end of the runway and then move down the length of the tarmac as they gain height. It is a precaution in case of engine failure.

For an hour the airport is dominated by the helicopters—not the high pitched whine of jet engines, but the furious thrash of rotor blades.

This is, in fact, the world's largest heliport—a place where visitors quickly sense the daily excitement of the offshore oil industry and the air services that back it all up.

The mix of helicopters and yet planes is not an easy situation for a busy airport—the third busiest in Britain, in terms of air transport movements.

It is an extra load on air traffic controllers who co-ordinate landings between aircraft landing at the near walking pace of a helicopter to the speed of jets.

Helicopter traffic in March was up by more than 50 per cent compared with the same time last year. Much of this has been due to the replacement of fixed-wing aircraft by long range helicopters to reach distant fields. Previously, fixed-wing aircraft carried crews to Sunburgh Airport at the southern tip of the Shetland Islands where helicopters would then take them to offshore oil rigs.

Long range helicopters, such as the Chinooks, Sikorsky S76s and Super Pumas can now make the trip from Aberdeen.

Traffic level

Helicopter passenger traffic has reached over 400,000 a year as part of the 1.6m passing through the airport.

Mr Vernon Murphy, the general manager of the airport, points to the peculiarities of Dyce airport at Aberdeen. It serves a very small catchment area of around 350,000 to 400,000 people, a fraction compared to the millions within the reach of Heathrow or Gatwick.

This means that most of the passengers flying in to Aberdeen live elsewhere.

The airport is the busy hub of the North Sea air communications for five days a week. Then, over the weekend, all goes quiet and it again becomes the regional airport serving a small city.

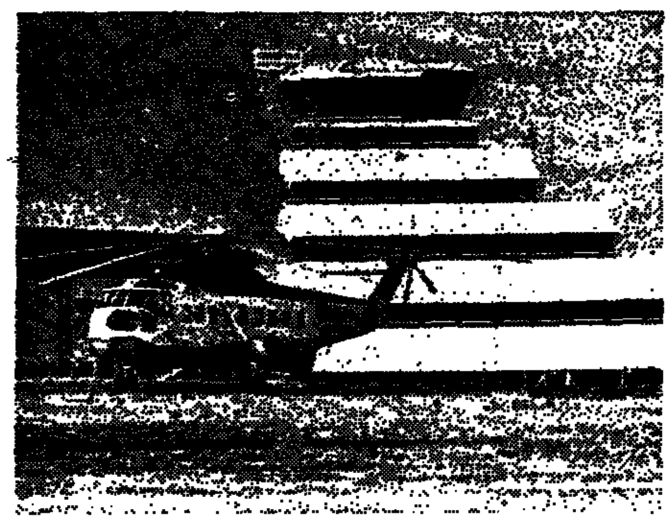
London is still a prime destination for passengers. British Airways have a TriStar, the first wide-bodied jet to use the airport, to cope with some of the pressure on flights.

Dan-Air and the smaller commuter services within Scotland and the British Isles, such as Air Ecosse, Loganair, and Air UK use the airport as well as a host of companies on charter business.

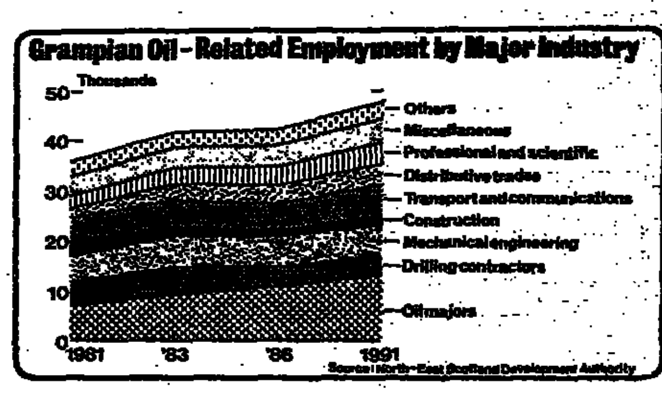
Mr Murphy also points to an increase in holiday traffic out of the airport—a nearly 30 per cent rise over the year from seven to 11 flights per week. Most of these are package holiday flights to Spain.

Despite an active programme of improvements such as radar assisted landing facilities on the main 6,000 foot runway and adjacent helicopter strip, there is still some feeling that things could improve.

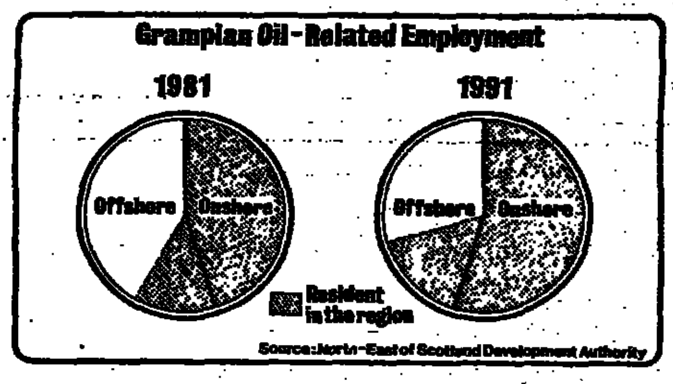
Access to the airport by road from the city is very poor with 30-minute journeys not uncommon through dense traffic.



The mix of helicopters and planes is not an easy situation for Aberdeen Airport—the third busiest airport in Britain, in terms of air transport movements. Above: A British Airways helicopter being prepared for a flight out to offshore oil installations.



Shortages of skilled labour in Grampian have eased, although demand will grow during the next five years, according to a recent survey by the Manpower Services Commission.



Employment figures, 1981: offshore 19,450, onshore, 16,499 (21,140 resident, 14,809 non-resident), total: 35,949. Forecast for 1991: offshore, 21,550, onshore, 25,940, resident, 33,900, non-resident, 13,600, total 47,500

Useful reading for the business visitor

● Grampian Quarterly Economic Review: A regular survey of the oil and non-oil economic situation, with regular special studies on subjects such as the fish processing industry, offshore gas, the regional whisky industry and advance factories.

Issued by: The Department of Physical Planning, Grampian Regional Council, Woodhill House, Ashgrove Road, West Aberdeen, AB9 2LU.

● NESDA, Offshore Directory: A directory issued by the North-east of Scotland Development Authority for the oil-related industries in the Aberdeen area.

Issued by: NESDA, 57 Queens Road, Aberdeen, AB1 6YP.

● Oil and Gas: Future impact upon Grampian region: papers from a symposium organised by Grampian local authorities and the UK Offshore Operators' Association in 1982.

Issued by: Grampian Regional Council, Department of Physical Planning (address above).

● Oil and gas-related prospects in Grampian (1982 update).

Issued by Grampian Regional Council, Department of Physical Planning (address above).

● Skilled Manpower Needs in the Grampian Region: A detailed study of the type of labour requirements for the area in the future.

Issued by: Manpower Services Commission, Training Division, Office for Scotland, 9 St Andrews Square, Edinburgh.

● Scotland: Petroleum Annual: an extensive list of offshore activities and onshore facilities.

Issued by: Aberdeen Petroleum Publishing Ltd, 37 Huntly Street, Aberdeen AB1 1TH.

● Scotland: the oil and gas future: a survey of the prospects for the industry surveyed by the Scottish Development Agency.

Issued by Scottish Development Agency: 120 Bothwell Street, Glasgow G2 7JP.

Work has now begun on Aberdeen's ninth offshore support base

Harbour Board strengthens facilities

ABERDEEN HARBOUR is at the heart of the North Sea oil business. And it *is here that the pulse of North Sea* activity can be taken.

The discovery of oil has totally transformed the harbour, though a slackening *of exploration activity has* led to an increase in the number of supply boats tied to the quay, waiting for new contracts.

To handle the supply ships and assoclaed onshore supply industries, the entire harbour has been rebuilt since 1969. The lock gates had to be dismantled and the quays rebuilt to allow *the boats 24-hour access—there can be* no question of a boat waiting for the tide in an industry where time is money.

Earlier this month, the Aberdeen Harbour Board opened its eighth offshore support base at Pocra Quay and simultaneously announced the start of work on the ninth.

Today, Amoco, Chevron, Shell, Texaco and Total have leased their own quay *facilities. Two other quays are owned* by Seaforth Maritime and the John Wood group, two supply companies offering offshore operators "one-stop-shopping" for supplies, ranging from drillpipes to hamburgers.

Public quays handle further traffic for independent operators.

Oil activity now accounts for about half the harbour's revenue in terms of dues on ships and goods.

A three-month overtime ban by registered dockers at the start of 1982 dented the harbour's overall operating surplus from £2.4m in 1981, to £1.4m last year. Now a long-term agreement for dockers, lasting into 1985, has increased the prospects for greater industrial stability.

Alongside the supply boats sailing past the breakwaters come the fishingboats. The city has a fleet of 45 vessels, 23 of them trawler. But this is a shadow of what the harbour was in the past. In *1980 the amount of fish landed at* Aberdeen was the lowest since 1898. Tonnage has increard to a current level of 44,981 tonnes.

The introduction of the National Dock Labour Scheme led to a gradual exodus of fishing vessels to other ports, such as Peterhead, where the scheme was not in operation.

But Aberdeen is still the largest fish market in Scotland and the place where 70 per cent of the fish processing is carried out.

Improved handling and a new fish market has sen the start of a slow return of fishing traffic to Aberdeen.

A recent study by the Sea Fish Industry Authority noted that today, on balance, Aberdeen has certain marginal advantages over Peterhead—a port to land fish.

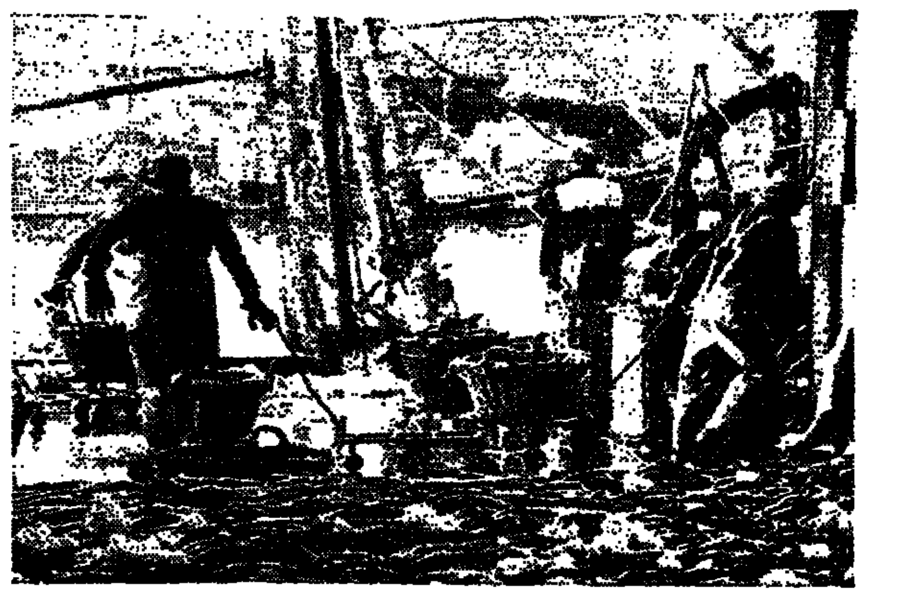
About 30 per cent of the UK requirement in demersal fish—mostly haddock *—are landed at these ports.*

The report pointed out that while landing costs can be 30 to 33 per cent higher in Aberdeen, the fish usually fetch a better price.

It noted the practice of overfilling boxes prevailed in Peterhead, but not Aberdeen, a further advantage for fishermen who could lose up to £16,000 a year through this practice in Peterhead.

General cargo also accounts of a sizable amount of activity at the port, and, currently, new cranes are being installed to improve grain and other *bulk* cargo *handling.*

Mr John Turner, the general manager of the port has been hunting a European ferry link for the international ro-ro terminal in the port. Aberdeen is already the base harbour for sea links between the mainland and Orkney and Shetland.



Aberdeen, with its fleet of 45 fishing vessels, has the largest market for fish in Scotland. It is the country's main fish processing centre

BUSINESS CONTACTS

USEFUL business contacts and telephone numbers in Aberdeen include the following:

- Grampian Regional Council, Department of Physical Planning; Mr Trevor Sprott, Director; tel. (0224) 682222.
- The North-East Scotland Development Authority (NESDA); Mr Gordon Sampson, Director; tel. (0224) 643322.
- Aberdeen District Council, Department of Development and Tourism; Mr Gordon Henry, Director; tel. (0224) 642121.
- Aberdeen Harbour Board; Mr John Turner, General Manager; tel. (0224) 52571.
- Aberdeen Airport; tel. (0224) 722331.

OFFSHORE EUROPE

MORE THAN 20,000 visitors from around the world are expected at this year's Offshore Europe exhibition at Aberdeen.

The event (from September 6-9) will be held in a specially-erected seven-acre exhibition hall and will be opened by Mr Nigel Lawson, the Energy Secretary.

Offshore Europe '83 has attracted more than 700 exhibitors from such countries as Canada, Denmark, Finland, France, West Germany, Italy, the Netherlands, Norway, Sweden, Switzerland and the U.S.

The European Cup comes *to Aberdeen: Lord Provost Collie* appears on the flag-draped balcony of the Town Hall in Union Street, Aberdeen, to cheer the triumphant soccer team after its return from Gothenburg, Sweden, following the recent 2-1 victory over Real Madrid. Jubilant fans lined the 10-mile route from the airport.

Traditional industries take a battering

OIL has not blessed every corner of Aberdeen. This vast industry has, over the past decade, overwhelmed a small city of around 200,000 which traditionally served its rural hinterland.

While bringing a prosperity unheralded in the city's history, Aberdeen's traditional industries have taken a battering—*industries such as fish processing*, paper textiles and engineering which all pre-dated the discovery of oil.

Oil has imposed a dual economy on the city in terms of wages, labour and costs—one for the offshore industry and one for traditional industries. Companies found large segments of their skilled staff lured away to better-paid oil jobs.

A recent study has shown that in many cases Aberdeen's manufacturing sector has been hit harder than that of other cities in Scotland.

The manufacturing sector shrank by nearly 20 per cent from 1977 and 1981. As with industry in other less heavily populated areas of the region, industrial body blows hurt more when there are fewer alternatives for employment *than in large cities.*

A study of the non-oil industry was published last month by Prof Hugh Begg and Mr Stuart McDowall.*

Between 1977 and 1981, one-quarter of jobs in the food industry and one-fifth of engineering, *shipbuilding* and textile employment had gone.

The report noted that the recession had hit manufacturing most heavily. Three-quarters of all redundancies in 1978 occurred in manufacturing, although this sector only accounted for one-fifth of the jobs.

Argument

At the core of the argument *put by Grampian region,* which includes Aberdeen, against the loss last year of assisted area status was the damage this would have on the non-oil sector.

The Government's decision to remove this classification with its associated grant structure *because of the relative* benefit brought by oil is now a disincentive for inward investment in manufacturing for Aberdeen.

The picture, however, has not been one of all-pervading gloom. The Begg McDowall report looked at the long-term implications and pointed to improvements and opportunities for new growth. It counselled the city and regional councils to develop a programme *of industrial diversification.*

The common fishing policy of the EEC promises some stability for the fish processing industries and, this accompanied by a new marketing drive to promote fish, may offer this sector a better future.

Textiles have gone through a period of contraction and no growth in the paper and board sector was forecast partly because of the distance from markets and rising costs.

Since the report was drawn up, however, Wiggins Teape has announced plans to spend £6m modernising their plant at Stoneywood Mill on the fringes of the city.

The thrust of new industrial development, according to the report, should be in small companies, value-added products—particularly in microelectronics—and products with good export potential or ones with sufficient demand locally to justify production.

The report underlined a central theme of UK industrialists in Aberdeen that consider*able opportunities are missed in* the areas of microelectronics which could be applied to the myriad of downstream activities of the offshore industry.

* * *

* *Aberdeen's Manufacturing Industry; study by H. M. Begg and S. McDowall; Aberdeen City Council.*

Changing patterns in employment

		Employee total 1971	Employee total 1977	Change 1971-77 No.	Change 1971-77 %
Aberdeen LEOA	Manufacturing	25,293	22,807	− 2,486	− 9.8
	Total	99,229	119,817	+20,588	+20.8
Grampian	Manufacturing	39,489	38,361	− 1,128	− 2.9
	Total	150,981	178,524	+27,543	+18.2
Scotland	Manufacturing	669,000	615,000	−54,000	− 8.4
	Total	2,003,000	2,071,000	+66,000	+ 3.4

Source: Annual Census of Employment

No account is taken ni these figures of the self-employed or of the armed forces

Comparisons of manufacturing trends in Scottish cities

	Employment (000s) 1977	1979	1981	Change 1977-81 No.	%	Change 1979-81 No.	%
Aberdeen	21.7	21.0	17.1	− 4.6	−21.2	− 3.9	−18.6
Dundee	30.9	30.1	24.7	− 6.2	−20.1	− 5.4	−17.9
Glasgow	110.3	104.1	84.4	−25.9	−23.5	−19.7	−18.9
Edinburgh	34.8	35.3	31.5	− 3.3	− 9.5	− 3.8	−10.8

Source: SCOMER

AUTHORISED UNIT TRUSTS

FT UNIT TRUST INFORMATION SERVICE

INSURANCES

[illegible]

Total Perf. Unit Tst. 28.0 31.1 3.32

Discretionary Unit Fund Managers
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Disc Inc May 20 318.6 339 7 -21.7 4.28
For Dunbar see Oppenheimer Fund Management

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Continued above Mon-Fri and Stock Exchange Dealing Page Sat.

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JpExFd*	£133.37	137.65	....	1.30

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(b)GREGtFI	112.8	117 2	+0.1	9.85
(g)GRENAmT	93 2	100.3	−0 7	2.49
(g)GREPacTst	94 9	102 1	+0.3	1.22
(b)G dhilTst	174 9	181 2	−1.7	3 39
(b)GRESmCos	95 0	102 2	+0.8	1.53

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4 Gt St Helens, London EC4P 3EP 0708 45322

AustFrsGw	108 0	113.7	.	2 02

Brewin Cap	75.2	79.2	..	1.28
Brewin Gt Inc	69.8	73 5	...	3.65
CanGwthFd	91.7	98.7	...	1.15

Lawson Fund Managers Ltd (a) (c) (g)
43 Charlotte Sq, Edinbgh 2. 031-225 6001

Aust & Pac	7.8	8.3	..	0.69
High Yield‡	19.0	20 5	...	10.00
Do Accum‡	19.7	21 2		—

*Dealing Thurs. ‡ Dealing Fri.

MGM Unit Managers Ltd
MGM House, Heene Road, Worthing. 01-623 8211

High Inc	119 5	128.5	−0.2	6.41
(Accum Uts)	121.2	130 3	−0.2	6.41
UK Growth	112.6	121.0	−0.6	3 56
Accum Uts	112.8	121.3	−0.5	3.56

MLA Unit Trust Management Ltd
Old Queen Street, SW1A 9JG. 01-222 8576

MLA Units	168.6	177 0	....	2.82
MLA Int	24.7	25.9	...	1 00

The Money Market Trust
63 Qn Victoria St, EC4N 4ST. 01-237 0952

Call Fund	—	—	....	10 16
7 Day Fund	—	—		10.04

†Unauthorised—Sterling Deposit Fund.

Offshore and Overseas—continued

Actibonds Investment Fund SA
37 rue Notre Dame, Luxemburg. Tel. 47971

Actibonds Inv	—	$20 04	...	—

Bamford Brandt Guernsey Mngt Ltd
PO Box 71 St Peter Port, Guernsey. 0481 26541

Tech & Commns	—	£10 00	....	—

CAL Investments (IoM) Ltd
16 St Georges St Douglas IoM. 0624 25031

CALCM&C	0.949	0 999	.	—
CALMetals	0 926	0 975	.	—

Dealing days every Monday.

CAL Investments (Bermuda) Limited
PO Box 1022, Hamilton, Bermuda (809-29) 5-5950

CAL CTR Fd	0 99	1 05	....	—

Dealing days every Monday.

Commodity Advisory Svcs (IoM) Ltd
48 Athol St, Douglas, IoM. 0624-20845

Com&FFFd(Acc)	102.78	107.06	—
Com&FFFd(Dist)	102 78	107 06	—

Next dealing date June 6.

DunVest Ltd
PO Box 887, Grand Cayman

NAV May 1	$126 00	—

Framlington Overseas Fund Mngt Ltd
PO Box 71, St Peter Port, Guernsey. 0481 26541

O'seasInc&Gth	—	50.0	.	—

Manufacturers Hanover Geofunds
PO Box 92, St Peter Port, Guernsey. 0481 23961

LA Inc	$105 26	105.48		—
LA ACC$	$121.19	121.45	...	—
MI T Inc	$118 96	119.56	..	—
MITAcc$	$131.18	131 85	..	—

Marine Midland (CI) Ltd
140 B'way, NY 10015, USA 212-440-1000
Queens Hse, Don Rd, St Helier. 0534 71460

Intcurcy	$1,000.0	—	....	—

Initial offer. Next sub day June 16.

Norcap Fund Managers (Bermuda) Ltd
Bank of Bermuda Bldg, Bermuda. 809 29 5400

Amer Tst	$11 91	12.30	....	—

Perpetual UT Managers (Jersey) Ltd
PO Box 459, St Helier, Jersey. 0534 74517

Offshr Grth	$1.077	1.146	. .	2 00

Rothschild Asset Management (CI)
St Julian's Ct, St Peter Port, Guernsey. 0481 26741

OC International Reserves Ltd

Bel Francs	BFr840.70	+1.04	9 16
Canadian $	C$36 09	+0.04	8.50
D-Mark	DM50.315	+0.03	3 81
Dutch Guilder	Fl49 835	+0 03	4.14
French Franc	FFr158.575	+0 245	11.12
Italian Lire	L35.601	+20	19.86
Japanese Yen	Y6.192.88	+0 85	5.17
Singapore $	S$62.705	+0.015	7 90
£ Sterling	£14.037	+0.004	9 41
Swiss Francs	SwFr45.444	+0 018	2.86
U.S. $	$28.765	+0.005	7.97

Daily dealings.
For other Rothschild Offshore Funds see Offshore and Overseas section.

SCI/Tech SA Nav
2 Boulevard Royal, Luxembourg.

SCI/Tst Nav	—	10.32	+0.05	—

Schroder Mngt Services (Jersey) Ltd
PO Box 195, St Helier, Jersey. 0534 27561
Schroder Money Funds Ltd

Sterling	£13 6773	....	—
U.S. Dollar	$25 6255	...	—
D-Mark	DM50.6273	...	—
Swiss Franc	SwFr50.3681	...	—

Tyndall-Guardian Management Ltd
PO Box 1256, Hamilton, Bermuda

T.G Am	$24 185	—	...	—
T-G Money	$20.89	—	....	—
T-G E'bnd	$15 95	—	....	—
T-G Com	$22.30	—	....	—
T-G Mort	C$19.24	—	....	—
T-G O'seas	$12.09	—	....	—
T-G Pacific	1.849	—	....	—
T-G Wall St	$24.97	—	....	—

Insurances—continued

Albany Life Assurance Co Ltd
3 Darkes Lane Potters Bar. 0707 42311

Pension Funds

EqPenFdAc	563.9	593.6	−2.6	—
Fix I Pen AC	397.4	418.2	−0.5	—
GtMinPenAc	238.2	250.7	+0.1	—
IntMnPenAc	232.7	244.9	−1.3	—
NAmPFdAc	126.1	132.7	−1.4	—
Prop Pen Ac	216.2	227.5	+2.8	—
Mp In PnAc	477.7	502.8	−1.9	—

Commercial Union Group
St Helens, 1 Undershaft, EC3. 01-283 7500

VarblAcMay21	—	136.75	+1.24	—
An Uts May 27	—	31.77	+0.18	—
Prime Series				
Managed	105.5	111.1	−0.4	—
UK Equity	107.4	113.1	−0.2	—
Int Equity	105.4	111.0	−0.7	—
Property	97.4	102.6	....	—
Fixed Int	101.6	107.0	....	—
Indx Lnkd Gt	92.2	97.1	−0.4	—
Cash	96.6	101.9	....	—
Hand-in-Hand				
Cash	118.2	124.5	....	—
Fixed Int	135.2	142.4	....	—
Property	135.9	143.1	....	—
NatWest	172.6	181.7	....	—

Continental Life Insurance PLC
64/70 High St, Croydon, CR0 9XN. 01-680 5225

Equity Acc	130.6	137.5	....	—
Propty Acc	127.8	134.6	....	—
Intl Acc	141.7	149.2	....	—
ManagedAcc	137.1	144.4	....	—
PensEqtyAcc	151.3	159 3	....	—
PensPrpAcc	138.2	145.5	....	—
PensIntlAcc	132.1	139.1	....	—
PensMgdAcc	143.6	151.2	....	—

Gilt, Deposit, Index Fund prices available on request.

Friends' Provident Life Office
Pixham End, Dorking. (0306) 885055

Life Funds

Cash Accum	95.0	100.0	..	—
UK Eqty Acc	95.0	100.1	−0.7	—
Fxd Int Acc	94.8	99.8	..	—
Indx Lkd Acc	94.2	99.2	−0.6	—
Mxd Acc	95.0	100 0	−0.3	—
Overs's Eq Ac	94.6	99.6	..	—
Propty Acc	95.0	100.1	+0.1	—

Pension Funds

Cash Capital	95.0	100.1	..	—
Cash Accum	95.1	100.2	+0.1	—
UK Eqty Cptl	94.1	99.1	−0.8	—
UK Eqty Acc	94.2	99.2	−0.7	—
Fxd Int Captl	94.5	99.5	−0.1	—
Fxd Int Acc	94.5	99 5	..	—
Indx Lkd Cptl	93.9	98.9	−0 6	—
Mixed Captl	94.4	99.4	−0.4	—
Mixed Acc	94.5	99.5	−0.4	—
O'seas Eq Cap	95.0	100.0	−0.4	—
O'seasEqAcc	95.0	100.1	−0.4	—
Propty Captl	95 0	100.0	....	—
Propty Acc	95.0	100.0	....	—

Guardian Royal Exchange
Royal Exchange, EC3. 01-283 7107

GRE Pensions Management Ltd

PensPropInt	127.3	134.0	....	—
PensPropAcc	136.7	143.9	....	—
Pnsix-LkGtIn	93.9	98.8	−0.9	—
Pnsix-LkGtAc	94.0	98.9	−0.8	—
PensDepInt	133.3	140.3	....	—
PensDepAcc	143.3	150 8	....	—

Henderson Administration
11 Austin Friars, London EC2. 01-588 3622

High Inc	132.1	139.1	+1.1	—
Gilt Edged	95.8	100.9	+0.2	—
Cap Growth	135.9	143.1	−0.6	—
Technology	163 6	172.3	−0.3	—
Nat Res'ces	124.7	131.3	−0.1	—
Spec Sits	185.8	195.6	−0.6	—
N America	216.8	228.3	−1.1	—
Far East	159.4	167.8	−0.1	—
Property	113.6	119.6		—
Managed	178.3	187.7	−0.8	—

Deposit	114.8	120.9	....	—
Prime Rest	110.2	116.1	....	—

Pension Funds

UK Equity	97.2	102.4	−0.5	—
Fixed Int	103.4	108.9	..	—
Spec Sits	113.9	119.9	−0.2	—
N America	108.5	114.3	−0.6	—
Far East	106.4	112.0	−0.1	—
Managed	105.1	110.7	−0.5	—
Comm Propy	96.5	101.5	....	—
Prime Rest	96.5	101.5	....	—
Deposit	96 5	101.5	....	—

Capital Unit prices available on request.

London Life Linked Assn Ltd
100 Temple St, Bristol BS1 6EA. 0272-279179

Equity	205.9	212.0	....	—
Fixed Int	158.0	158.7	....	—
Property	161.9	166.7	....	—
Deposit	138.9	138.9	....	—
Mixed	180.3	184.0	....	—
Index Stk	112.0	112.5	....	—
International	104.6	106.6	....	—

London Life Managed Funds Ltd

Equity (P)	147.2	152.3	..	—
Fixed Int (P)	160.2	161.4	....	—
Property (P)	117.2	121.3	....	—
Deposit (P)	117.2	121.3	....	—
Mixed (P)	142.6	145.9	....	—
Indx Stk (P)	118.0	118.8	....	—
Internt'l (P)	102.2	104.2	....	—

Municipal Life Assurance Ltd
99-100 Sandling Road, Maidstone. 062 2679351

Mangd Fd	95.00	100.00	....	—

Premium Life Assurance Co Ltd
Eastchester House, Haywards Heath. 0444 458721

Nat Res'ces	111.0	117.0	....	—
Property	135.0	143.0	....	—
UK Equity	129.0	136.0	....	—
Intl Equity	120.0	127.0	....	—

Prudential Pensions Ltd
Holborn Bars, EC1 2NH. 01-405 9222

Pru-Link Retirement Plan

Managed Fd	136.6	142.3	....	—
Cash Fund	109.2	113.8	....	—

Save & Prosper Group
4 Gt St Helens, London EC3P 3EP. 0708-66966

Gilt Pen Fd	177.1	187.5	....	—
Dep Pen Fd‡	180.2	190.7	....	—
Gl Eq Pen Fd	53.4	56.6	....	—

Skandia Life Assurance Co Ltd
Frobisher Hse, Southampton. 0703-334411

Managed	147.0	154.7	+1.0	—
Equity	154.7	169.7	−0.4	—
Internatl	168.2	177.0	+0.1	—
Nth Amer	105.0	110.5	+0.2	—
Gilt Plus	135.7	142.8	+0.5	—
Property	126.4	133.0	..	—
Deposit	128.6	135.4	..	—
Pens Mangd	173.4	182.5	+1.4	—
Pens Equity	182.8	192.5	+2.6	—
Pens Intnl	199.0	209.5	+0.1	—
PensGtPls	161.2	169.7	+0.7	—
Pens Prpty	151.9	159.9	+0.2	—
Pens Dep	155.1	163.3	+0.2	—

For prices of Capital Units and Guaranteed Basis Rates please phone 0703 334411

Target Life Assurance Co Ltd
Target House, Gatehouse Road, Aylesbury Bucks. Aylesbury (0296) 5941

U.S. Dollar	—	—	.	5.2
Swiss Franc	—	—	....	3.9
Deutsche Mark	—	—	....	3.4
Yen	—	—	....	2.1

TSB Life Ltd
PO Box 3, Keens House, Andover, Hants SP10 1PG.

Managed Fd	99.2	104.5	+0.3	—
Property Fd	95.0	100.9	+0.1	—
Fixed Int Fd	96.3	101.5	−0.2	—
Money Fund	95.6	101.0	..	—
Equity Fund	103.1	108.6	+0.9	—

INSURANCE & OVERSEAS MANAGED FUNDS

Barclays Life Assur. Co. Ltd.—cont.

Income Accum.	106.1	111.7	-0.3	—
Do. Initial	104.4	109.9	-0.3	—
Man. Pens. Accum.	231.5	243.7	....	—
Do. Initial	194.1	104.4	....	—
Gilt-Edg. Pens. Accum.	200.6	211.2	....	—
Do. Initial	162.1	170.7	....	—
Money Pens. Accum.	177.6	289.3	....	—
Do. Initial	146.9	154.7	....	—

Black Horse Life Ass. Co. Ltd.
71, Lombard St., EC3 01-623 1288

Black Horse Man. Fd.		227.89	....	—
Managed Inv. Fd.	154.99	162.52	....	—
Property Fd.	148.53	156.04	....	—
Fixed Interest Fd.	140.65	148.06	....	—
Cash Fd.	133.37	140.99	....	—
Income Fd.	159.68	168.09	....	—
Extra Income Fd.	154.02	162.97	....	—
Worldwide Growth Fd.	212.89	224.10	....	—
Balanced Fd.	168.11	176.96	....	—
Smlr Co's & Recy. Fd.	197.96	208.38	....	—
Int. Technology Fd.	243.52	256.34	....	—
Nth. Amer. & Gen. Fd.	158.05	166.37	....	—
Energy Int. Fd.	94.12	99.08	....	—
Pacific Basin Fund	123.39	129.89	....	—

British National Life Assurance Co. Ltd.
Harlands Rd, Haywards Heath. 0444 414111

Equity	95.5	100.6	+1.1	—
International	118.6	124.9	-1.2	—
Property	105.5	111.0	+2.2	—
Deposit	97.1	102.2	+0.1	—
Fixed Interest	96.2	101.2	....	—
Managed	104.6	110.1	....	—
Equity Pens Cap	94.0	99.0	+1.3	—
Intnl. Pens. Cap.	124.0	130.5	-2.0	—
Property Pens Cap	106.6	112.2	+2.8	—
Deposit Pens Cap	96.2	101.3	+0.1	—
Fixed Int Pens Cap	94.9	99.9	-0.1	—
Managed Pens Cap	106.1	111.7	-0.2	—

Canada Life Group
2-6, High St., Potters Bar, Herts. P. Bar 51122

Equity Gth May 1		93.6	....	—
Retmt. Fed. May 6		233.0	....	—
Managed Pen Fund	174.2	183.4	....	—
Property Pen Fund	110.2	116.0	....	—
Index Lnkd Pen Fund	116.2	122.3	....	—
Managed	114.0	120.0	-0.5	—
Property	99.9	105.2	....	—
Gilt and Fixed Interest	100.1	105.4	....	—
Index-Linked	99.9	105.2	-0.4	—
Equity	113.2	119.2	-0.7	—
Cash	100.5	105.8	....	—
Midland Bk. Unit Tst.	111.4	117.3	-0.3	—
Midland Bank Intnl.	133.0	140.0	-0.3	—

Cannon Assurance Ltd.
1 Olympic Way, Wembley HA9 0NB. 01-902 8876

Equity Units	£35.34	—	....	—
Property Units	£16.88	—	....	—
Equity Bond/Exec	£23.21	24.56	+0.12	—
Prop. Bond/Exec	£22.07	23.35	....	—
Bal. Bd./Exec/Unit	£22.69	24.01	+0.09	—
2nd Equity Acc.	181.5	192.1	+1.1	—
2nd High Inc/Acc	132.7	140.4	+0.7	—
2nd Property Acc.	169.0	178.8	....	—
2nd Managed Acc.	164.6	174.2	+0.2	—
2nd Deposit Acc.	140.8	149.0	....	—
2nd Gilt Acc.	138.2	146.2	....	—
2nd American Acc.	192.5	203.7	-0.9	—
2nd Intl Money Acc.	138.5	146.6	-0.2	—
2nd Index Acc.	97.6	103.3	....	—
2nd Eq. Pens./Acc.	247.7	262.1	+1.7	—
2nd Hi Inc Pens/Acc.	137.7	145.7	+0.8	—
2nd Prp. Pens/Acc	209.7	221.9	....	—
2nd Mgd. Pens/Acc.	206.4	218.4	+0.3	—
2nd Dep. Pens/Acc.	181.6	192.2	+0.3	—
Gilt Pens/Acc.	176.3	186.6	....	—
2nd Am. Pens/Acc.	254.1	268.9	-1.3	—
2nd Inc MoneyPens/Acc	164.7	174.3	-0.7	—
2nd Index Pens./Acc.	102.8	108.8	....	—
L & E S.I.F.	70.5	74.5	....	—
L & E S.I.F. 2	48.0	51.0	....	—

Current value at May 19.

Capital Life Assurance
Coniston House, Chapel Ash W'ton. 0902 28511

Key Invest. Fd.	116.66	—	....	—
Pacemaker Inv. Fd.	120.78	—	....	—

Chieftain Assurance Funds
11 New Street, EC2M 4TP. 01-283 3933

G.T. Management Ltd.
16 Finsbury Circus, Lond EC2M 7DJ. 01-628 8131

G.T. Plan Bond Fund	121.7	128.2	....	—
GT Pln High Yld Fnd	111.5	117.4	+1.5	—
GT Plan Far East Fnd	99.9	105.2	+1.1	—
GT Pln N Am Fund	157.4	165.7	+3.3	—
GT Pln UK&G.E. Fnd	126.0	132.7	+2.1	—
GT Pln Wrldwde Fnd.	135.5	142.7	+1.5	—
GT Pension Bnd Fnd.	130.9	137.8	+0.2	—
GT Pen High Yld Fd.	125.8	132.5	+2.2	—
GT Pen Far East Fd.	117.0	123.2	+1.9	—
GT Pen N. Am. Fd.	222.0	233.7	+5.2	—
GT Pen UK & G.E. Fd.	144.5	152.2	+2.6	—
GT Pen Worldwide Fd.	144.7	152.4	+1.6	—

Assicurazioni GENERALI S.p.A.
117, Fenchurch St., EC3M 5DY. 01-488 0733

Intl. Managed Bond	162.3	170.9	....	—

General Portfolio Life Ins. C. Ltd.
Crossbrook St., Cheshunt, Herts. Waltham X 31971

Portfolio Fd. Acc.		236.0	....	—
Portfolio Fd. Init.		198.4	....	—
Portfolio Fd. Cap.		227.1	....	—
Investment A uts	235.9	248.4	....	—

Growth & Sec. Life Ass. Soc. Ltd.
48, London Fruit Exchange, E1 6EU 01-377 1122

Flexible Finance		1,468	....	—
Landbank Secs.		65.2	....	—
Landbank Secs. Acc.	180.2	184.8	....	—
G. & S. Super Fd.		£11.089	....	—

Guardian Royal Exchange
Royal Exchange, E.C.3. 01-283 7101

Guardian Assurance

Property Bonds	299.9	312.3	....	—

GRE Linked Assurance Limited

Managed Initial	200.8	211.5	+1.9	—
Do. Accum.	220.9	232.6	+2.1	—
Equity Initial	299.2	262.9	+3.1	—
Do. Accum.	274.1	288.5	+3.4	—
Fixed Int. Initial	185.7	195.4	-0.2	—
Do. Accum.	204.2	214.9	-0.2	—
International Initial	198.8	209.3	-2.4	—
Do. Accum.	218.7	230.2	-2.6	—
North American Initial	98.5	103.7	+0.2	—
Do Accum	98.6	103.8	+0.2	—
Index-Linked Gilt Init.	93.9	98.8	-0.4	—
Do. Accum	94.0	98.9	-0.4	—
Property Initial	124.4	130.9	....	—
Do Accum	136.6	143.8	....	—
Deposit Initial	121.0	127.4	....	—
Do. Accum.	133.1	140.1	....	—

GRE Pensions Management Ltd.

Pens. Managed Initial	196.1	206.4	+1.9	—
Pens. Managed Acc.	210.8	221.9	+2.1	—
Pens. Equity Initial	249.9	263.1	+2.8	—
Pens. Equity Acc.	268.7	282.9	+3.1	—
Pens. Fxd. Int. Initial	186.0	195.8	-0.3	—
Pens. Fixed Int. Acc.	200.0	210.5	-0.3	—
Pens. Int'l Initial	182.4	192.0	....	—
Pens. Int'l. Acc.	196.1	206.4	....	—

Continued on adjacent Page Mon-Fri and Stock Exchange Dealings Page Sat.

Hambro Life Assurance P.L.C.
Hambro Life Ctr, Swindon, SN1 1EL 0793 28291

Fixed Int. Dep. Acc.	181.1	190.7	....	—
Equity Acc.	366.1	385.4	....	—
Property Acc.	273.2	287.6	....	—
Managed Cap.	218.8	230.4	....	—
Managed Acc.	328.2	345.5	....	—
Overseas Acc.	244.7	257.6	....	—
Gilt Edged Acc.	200.4	211.0	....	—
American Equity Acc.	224.8	236.7	....	—
American Man Acc.	120.1	126.5	....	—
American Prop Acc.	98.0	103.2	....	—
Pen.F.I.Dep.Cap.	196.6	207.0	....	—
Pen.F.I.Dep.Acc.	272.3	286.7	....	—
Pen. Prop. Cap.	332.6	350.2	....	—
Pen. Prop. Acc.	506.5	533.3	....	—
Pen. Man. Cap.	395.7	416.6	....	—
Pen. Man. Acc.	604.8	636.7	....	—
Pen.GiltEdg.Cap.	215.9	227.3	....	—
Pen. Gilt Edg. Acc.	269.8	284.0	....	—
Pen. Eq. Cap.	325.3	342.5	....	—
Pen. Eq. Acc.	641.0	674.8	....	—
Pen. B.S. Cap.	195.5	205.3	....	—
Pen. B.S. Acc.	263.3	276.5	....	—

OFFSHORE AND OVERSEAS

Inv. Adv., M. & G. Inv. Mngt., Ltd., London.

Perpetual U.T. Mgrs (Jersey) Ltd.

See adjacent Page Mon.-Fri. and Stock Exchange Dealings Page Sat.

Phoenix International
PO Box 77, St. Peter Port, Guern. 0481 26741

Inter-Dollar Fund	$4.50	4.85	-0.03	—
Far East Fund	$3.02	3.26	....	—
Intl. Currency Fund	$1.75	1.89	-0.01	—
Dollar Fxd. Int. Fund.	$3.62	3.90	-0.02	—
Ster. Exempt Gilt Fd.	£2.15	2.32	-0.01	—

Providence Capitel International Ltd.
PO Box 121, St Peter Port, Guernsey 0481 26726/9

UK Stockmarket	£1.330	1.431	....	—
Intl. Stockmarket	$0.996	1.072	....	—
World Technology	$1.091	1.174	....	—
N. Am. Stockmarket	$1.287	1.385	....	—
Far East	$0.940	1.012	....	—
UK Fixed Interest	£1.245	1.340	....	—
Intl. Fixed Int.	$1.141	1.228	....	—
Intl. Currency	$1.015	1.092	....	—
Intl. Money Market	$1.035	1.113	....	—
U.K. Money Market	£1.022	1.100	....	—
Stlg. Mangd. Fd.	£1.151	1.238	....	—
Dollar Mangd. Fd.	$1.115	1.200	....	—

Savings Target Rate 18/57.
Prices on May 10. Next dealing May 17.

Quest Fund Man. (Jersey) Ltd.
PO Box 194, St Helier, Jersey. 0534 27441

Quest Stlg. Fxd. Int.	£0.830	0.879	-0.001	10.24
Quest Intl. Secs.	$1.118	1.203	-0.012	1.16
Quest Intl. Bd.	$0.902	0.955	-0.005	10.05

Prices on May 18. Next dealing May 25.

WestAvon Secs (Guernsey) Ltd
PO Box 214, St Peter Port, Guernsey 0481 27768

Gilt & Option Fd.	£1.06	1.11	....	3.00
US $ Option	$1.00	1.05	....	—

World Wide Growth Management
10a, Boulevard Royal, Luxembourg

Worldwide Gth Fd	$15.20		-0.07	—

Inv. Adv.: M. & G. Inv. Mngt., Ltd., London.

Wren Commodity Management Ltd.
10, St. George's St., Douglas IoM 0624 25015

Wren Com. Fund	36.4	37.9	....	3.10
Chinese Fund	81.6	85.0	....	1.70
Precious Metal Fund	136.8	142.3	....	8.30
Vanguard Cmdy. Fd	43.2	44.3	....	2.26
Financial Futures Fd.	115.3	120.0	....	—
Wren Intl. Fnd *	$0.921	0.958	....	—

NOTES

Prices are in pence unless otherwise indicated and those designated $ with no prefix refer to U.S. dollars. Yields % (shown in last column) allow for all buying expenses. a Offered prices include all expenses. b Today's prices. c Yield based on offer price. d Estimated. g Today's opening price. h Distribution free of UK taxes. p Periodic premium insurance plans. s Single premium insurance. x Offered price includes all expenses except agent's commission. y Offered price includes all expenses if bought through managers. z Previous day's price. ¶ Guernsey gross. # Suspended. ♦ Yield before Jersey tax. † Ex-subdivision. ‡‡ Only available to charitable bodies. ♦ Yield column shows annualised rate of NAV increase.

FT LONDON SHARE INFORMATION SERVICE

BRITISH FUNDS

"Shorts" (Lives up to Five Years)

Interest Due		Stock	Price £	Last xd	Yield Int.	Yield Red.
18Ja	18Jul	Treasury 9¾pc '83	99⅔	13.12	9.27	10.28
22May	22N	Exch. 13½pc '83	101⁵⁄₃₂xd	15.4	13.29	10.12
12Jan	12D	Exch. 10pc 1983	100xd	5.11	10.00	10.03
15Jul	15Ja	Funding 5½pc '82-84‡‡	97¼	9.12	5.65	10.02
20Aug	20F	Exch. 11¼pc 1984	100⅝	14.1	11.18	10.27
22N	22May	Exchequer 14pc 1984	103⅛xd	15.4	13.53	10.26
19D	19Jan	Exch. 3pc 1984	95⅛xd	12.11	3.15	7.69
26Mar	26S	Treasury 12pc 1984	102⅛	17.2	11.75	10.18
22Aug	22F	Treasury 15pc 1985	106¾	17.1	14.05	10.62
22S	22Mar	Exch. 12pc Cnv. '85	103⅝	14.2	11.58	9.73
21N	21My	Treasury 3pc 1985	90⅞xd	14.4	3.31	8.03
15Jan	15Jul	Treasury 11½pc 1985	101⅛	9.12	11.35	10.81
3 Sept		Treas 8¾pcCnv '85	96⅛	—	9.04	10.33
22May	22N	Exch. 12¼pc 1985	102⅞xd	15.4	11.90	10.83
25 Aug.	25F	Exch. 11½pc '86	101⅞	19.1	11.53	10.91
19N	19May	Treasury 3pc 1986	86⅞xd	12.4	3.45	8.02
19 Nov	—	Exch. 10½pcCv.'86 (£65pd)	66¼	—	10.50	10.49
12D	12Jun	Treasury 12pc '86	102⅞xd	5.11	11.68	10.94
10Ja	10Jul	Treasury 8¼pc '84-86‡‡	95⅛	6.12	8.92	10.31
14Ja	14Jn	Treas. 12¼pc '86 Cnv.	109	8.12	11.24	8.89
29Apr	29Oct	Exch. 14pc 1986	108	21.3	12.96	11.12
22Jul	22Jan	Exch. 13¼pc 1987	106⅛	16.12	12.49	11.16
—		Exchequer 2½pc 1987	81⅜	—	3.07	8.43
Oct 6	Apr 6	Exch. 10½pc 1987	98⅜	1.3	10.68	11.02
6 Oct	—	Exch. 10½pc 1987A	98⅜	—	10.69	11.06
1N	1May	Funding 6½pc '85-87‡‡	89¼	25.2	7.28	9.84
14Ja.	14Jul	Treasury 3pc 1987	81⅛	8.12	3.70	8.48
3 May	3N	Treas 12pc 1987	102⅝	28.3	11.70	11.23
26Jul	26Ja	Treasury 7¾pc '85-88‡‡	90⅝	20.12	8.58	10.39
—		Exch 10½pc '88	97⅞	5.4	10.75	11.12

Five to Fifteen Years

Over Fifteen Years

Undated

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INT. BANK AND O'SEAS GOVT. STERLING ISSUES

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Building Societies

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INDUSTRIALS (Miscel.)

INDUSTRIALS—Continued

Dividends Paid	Stock	Price	Last xd	Div Net	C'vr	Y'ld Gr's	P/E
Jan Oct	Initial	359	31.12	†10.75	2.5	4.3	11.1
Aug Dec	Inter-City 20p	33	1179	—	—	—	—
—	Jameson Inv. Sm. 20p	178	21.3	ø4.0	7.8	3.2	24.7
Feb Aug	Jacksons Bourne	175	31.12	5.0	3.1	4.1	11.3
August	James Inds. 10p	24	11.4	1.25	♦	7.8	♦
Nov June	Jardine M HK$5	117	25.4	080c	♦	6.6	♦
July Jan	Jenks & Cattell	30xd	9.5	1.06	♦	5.0	♦
Oct. Apr.	Johnson Clnrs.	299	11.4	10.8	2.8	5.2	8.4
Feb. Aug	Johnson Mthy £1	320	13.12	10.0	1.9	4.5	(14.0)
Jan. July	Johnston Grp. 10p	350	17.5	6.0	5.0	2.5	11.6
Oct. June	Jourdan (T.) 10p	98	21.3	5.4	1.2	8.3	13.6
May Dec.	Kalamazoo 10p	51	25.4	2.5	0.9	7.0	22.8
Feb. July	Kelsey Inds.	170	31.12	8.0	1.7	6.7	11.7
Nov. April	Kershaw (A.) 5p	135	21.2	15.0	0.6	15.9	(20.3)
Jan. Aug.	Kleen-E-Ze Hldgs.	53	13.12	13.0	0.2	8.1	—
Jan. Aug.	L.C.P. Hlds.	69	29.11	3.6	8.6	7.5	(40.3)
Oct. April	L.R.C. Intl. 10p	119	21.2	13.1	2.0	3.7	20.1
July-Dec	Lamont Hldgs. 10p	28	1.11	1.3	1.8	6.6	11.8
Dec. May	Lawtex	35	1782	—	—	—	—
Mar. Oct.	Lep Group 10p	350	31.12	17.5	1.7	7.1	(10.2)
Oct. July	Lilleshall 10p	33	9.5	d1.0	—	4.3	—
Jan Oct	Lon. & Liv. 10p	152	29.11	5.5	♦	5.3	♦
Jan. Sept.	London & Mid'd	126	13.12	7.75	1.1	8.8	(13.6)
Jul. Dec.	Lon. & Nthn. Grp.	80	15.11	†3.75	2.1	6.7	8.5
—	✠Lon. Priv Health	27	—	—	—	—	13.5
Jan. June	Long Hmbly. 10p	9½	1279	♦B—	—	—	—
Mar Oct	Longton Inds.	55	6.9	1.0	—	2.6	—
	Low & Bonar 50p	94	25.4	5.0	0.6	7.6	(40.8)
June Dec.	M.Y. Dart. 10p	20	1.11	0.1	—	0.7	—
May Sept.	M'c'rthy Ph. 20p	139	22.2	7.0	2.5	7.2	6.9
Oct. May	Macfarlane Gp.	140	11.4	3.52	2.1	3.6	17.1
July Nov.	Maclellan 20p	41	4.10	d1.5	1.6	5.4	14.4
Aug. Mar.	Macpherson (D.)	58	21.2	4.2	0.6	10.3	(31.2)
Oct. Apr.	Magnolia Group	53	11.4	2.3	3.2	6.2	6.2
Apr. Oct.	Man. Ship Can. £1	137	980	3.5	6.8	3.7	4.1

LEISURE—Continued

Dividends Paid	Stock	Price	Last xd	Div Net	C'vr	Y'ld Gr's	P/E
May Nov	Boosey & Hawkes	172xd	9.5	2.3	♦	1.9	♦
Mar. Nov	Campari Int. 20p	50	11.4	d2.73	♦	7.8	♦
Feb June	Fairline Boats 10p	29	13.12	td1.0	—	5.0	—
—	GRA Group 5p	15	—	—	—	—	19.3
May Nov	Grampian TVA 10p	54	25.4	3.6	♦	10.0	♦
May Oct.	HTV Non/Vtg.	151	21.3	11.0	2.0	10.4	6.7
May Oct.	Horizon	158	21.3	3.6	5.7	3.2	6.9
Jan Aug	Intasun 10p	127	31.12	3.5	4.8	3.9	6.5
Jan Dec	LWT "A"	141	11.4	11.08	1.1	11.2	11.3
—	✠Leisure Inds.	340	13.12	♦‡6.0	3.0	2.5	16.1
Jan Jul	Leisuretime Int 10p	108	11.4	g1.54	♦	2.0	♦
June Jan.	Mayne Ag. IR 10p	113	31.12	8.75	1.6	11.4	8.0
Apr. Dec.	Metminster 10p	52	21.3	†4.0	0.8	11.0	16.4
—	✠Mimesis Int 20c	76	—	—	—	—	—
Jan. Sept.	Norton Opax. 10p	105xc	13.12	t2.17	0.5	2.9	—
—	✠Owners Abroad	23	11.4	0.5	♦	3.1	♦
June Nov	Photax (Lon.)	36	30.4	—	—	—	—
—	✠Pineapple Dance St 10p	92	—	wd1.5	2.1	2.3	22.7
Sept. Apr.	Pleasurama 5p	302	17.1	c5.25	4.5	2.7	17.9
—	✠Radio City 'A' NV	165	31.12	g5.6	1.6	4.9	17.7
July Jan	Riley Leisure 10p	169	13.12	3.95	1.7	3.4	23.4
Apr. Nov.	Saga Hols. 20p	130	11.4	d3.73	—	4.1	—
May Dec.	Samuelson Grp 20p	475	15.2	¶d12.0	2.8	3.7	16.4
Dec May	Scott. TV 'A' 10p	98	25.4	7.35	2.2	10.7	6.0
—	✠SelecTV 10p	35	—	—	—	—	—
May Nov	TSW 5p	16	25.4	0.9	3.3	8.0	5.4
—	✠TVS N/Vtg 10p	33	—	—	—	—	—
—	✠Television Servs 10p	20	—	b0.2	3.3	1.4	30.8
Oct Apr	Trid'nt TV 'A' 10p	79	21.2	♦4.26	1.4	7.7	13.5
—	✠21st Century Dist	118	—	—	—	—	—
April Sept	Webb (Jos.) 5p	18	2.8	d0.51	0.3	4.1	—
Apr. Nov	Zetters 5p	79	7.3	2.75	2.9	5.0	10.0

MOTORS, AIRCRAFT TRADES

Motors and Cycles

Commercial Vehicles

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MINES

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Far West Rand

O.F.S.

Finance

Diamond and Platinum

MINES—Continued

Central African

Dividends Paid	Stock	Price	Last xd	Div Net	C'vr	Y'ld Gr's
Nov. May	Falcon Rh.50c	250	1.9	Q70c	♦	21.5
Nov. May	Wankie Col. Z$1	21	25.4	Q5c	0.7	14.0
—	Zam.Cpr SBD0.24	24	980	—	—	—

Australians

Dividends Paid	Stock	Price	Last xd	Div Net	C'vr	Y'ld Gr's
—	♥ACM 20c	17½	—	—	—	—
	For Argosy Gld Mines see Southern Ventures					
—	Balmoral Resources	22	—	—	—	—
—	♥Black Hill Mins.	52	—	—	—	—
—	♥Bond Corp.	57	—	Q010c	2.3	10.8
Nov. Apr.	♥Bougainville 1 Kua	152	11.3	Q142c	1.2	14
May Nov	♥CRA 50c	298xr	11.3	t03c	—	0.6
—	♥Carr Boyd 20c	41	—	—	—	—
—	♥Central Pacific	24	—	—	—	—
—	♥Crusader Oil	345	—	—	—	—
—	♥Cultus Pac NL	9	—	—	—	—
—	♥Eagle Corp 10c	14½	—	—	—	—
—	♥Endeavour 20c	9½	—	—	—	—
Apr. Oct	♥GM Kalgoorlie 25c	580	28.9	hQ10c	♦	1.0

Tins

Miscellaneous

Dividends Paid	Stock	Price	Last xd	Div Net	C'vr	Y'ld Gr's
—	Admiral Mines	135	—	—	—	—
—	♥Anglo-Dominion	60	—	—	—	—
—	♥Anglo Utd. Dev.	83	—	—	—	—
—	♥Colby Res Corp.	85	—	—	—	—
Aug. Feb.	Cons. Murch. 10c.	440	23.12	‡Q60c	1.9	‡
—	‡‡Explaura Gold	3	—	—	—	—
—	♥Highwood Res.	120	—	—	—	—
—	Homestake Mining $1	£19½xd	17.5	Q40c	—	1.3
—	Northgate C$1	405	977	—	—	—
Jan. July	R.T.Z.	595xd	9.5	16.0	1.9	3.8
Jan July	Do 9½%Cn Ln 95-2000	£129xd	9.5	Q9½%	21.4	f7.4
—	♥Sabina Inds C$1	280	—	—	—	—
May	✠Southwest Res 10p.	17½	13.12	—	—	—
—	♥Tara Exptn $1	585	—	—	—	—

NOTES

Unless otherwise indicated, prices and net dividends are in pence and denominations are 25p. Estimated price/earnings ratios and covers are based on latest annual reports and accounts and, where possible, are updated on half-yearly figures. P/Es are calculated on "net" distribution basis, earnings per share being computed on profit after taxation and unrelieved ACT where applicable; bracketed figures indicate 10 per cent or more difference if calculated on "nil" distribution. Covers are based on "maximum" distribution; this compares gross dividend costs to profit after taxation, excluding exceptional profits/losses but including estimated extent of offsettable ACT. Yields are based on middle prices, are gross, adjusted to ACT of 30 per cent and allow for value of declared distribution and rights.

- ● "Tap" Stock.
- * Highs and Lows marked thus have been adjusted to allow for rights issues for cash.
- † Interim since increased or resumed.
- ‡ Interim since reduced, passed or deferred.
- ‡‡ Tax-free to non-residents on application.
- ♦ Figures or report awaited.
- ♥ Not officially UK Listed; dealings permitted under Rule 163(4)(a).
- ✠ USM; not listed on Stock Exchange and company not subjected to same degree of regulation as listed securities.
- ‡‡ Dealt in under Rule 163(3).
- # Price at time of suspension.
- ¶ Indicated dividend after pending scrip and/or rights issue: cover relates to previous dividend or forecast.
- ♦ Merger bid or reorganisation in progress.
- ♣ Not comparable.
- ♠ Same interim: reduced final and/or reduced earnings indicated.
- § Forecast dividend; cover on earnings updated by latest interim statement.
- ‡ Cover allows for conversion of shares not now ranking for dividends or ranking only for restricted dividend.
- ☆ Cover does not allow for shares which may also rank for dividend at a future date. No P/E ratio usually provided.
- ǁ No par value.

B.Fr. Belgian Francs. Fr. French Francs. ¶¶ Yield based on assumption Treasury Bill Rate stays unchanged until maturity of stock. a Tax free. b Figures based on prospectus or other official estimate. c Cents. d Dividend rate paid or payable on part of capital, cover based on dividend on full capital. e Redemption yield. f Flat yield. g Assumed dividend and yield. h Assumed dividend and yield after scrip issue. j Payment from capital sources. k Kenya. m Interim higher than previous total. n Rights issue pending. q Earnings based on preliminary figures. s Dividend and yield exclude a special payment. t Indicated dividend: cover relates to previous dividend, P/E ratio based on latest annual earnings. u Forecast dividend: cover based on previous year's earnings. v Subject to local tax. x Dividend cover in excess of 100 times. y Dividend and yield based on merger terms. z Dividend and yield include a special payment: Cover does not apply to special payment. A Net dividend and yield. B Preference dividend passed or deferred. C Canadian. E Minimum tender price. F Dividend and yield based on prospectus or other official estimates for 1983-84. G Assumed dividend and yield after pending scrip and/or rights issue. H Dividend and yield based on prospectus or other official estimates for 1984. K Figures based on prospectus or other official estimates for 1982-83. M Dividend and yield based on prospectus or other official estimates for 1983. N Dividend and yield based on prospectus or other official estimates for 1982-83. P Figures based on prospectus or other official estimates for 1982. Q Gross. T Figures assumed. Z Dividend total to date.

Abbreviations: xd ex dividend; xc ex scrip issue; xr ex rights; xa ex all; xR ex capital distribution.

REGIONAL AND IRISH STOCKS

The following is a selection of regional and Irish stocks, the latter being quoted in Irish currency

				IRISH		
				Exch. 15pc 1983	£100	.....
Albany Inv. 20p	61	+2		Nat. 9¾% 84/89	£87½	..
Bdg'wtr. Est. 50p	260	.....		Fin. 13% 97/02	£97¾	+¼
Craig & Rose £1	£12	.....		Alliance Gas	103	.....
Finlay Pkg. 5p	36	.....		Arnott	185	.....
Graig Shp. £1	£21	.....		Carroll (P.J.)	107	.....
Higsons Brew	102	−5		Concrete Prods.	52	.....
Holt (Jos) 25p	910	.....		Heiton (Hldgs.)	16	.....
I.O.M. Stm. £1	100	−2		Irish Ropes	36	.....
Pearce (C. H.)	£25	+½		Jacob	76	.....
Peel Hldgs.	200	.....		T.M.G.	70	.....
				Unidare	73	.....

OPTIONS

3-month Call Rates

Industrials					
Allied-Lyons	15	House of Fraser	17	Utd. Drapery	14
BOC Grp.	20	I.C.I.	35	Vickers	12
B.S.R.	12	"Imps"	11	Woolworth Hld.	27
Babcock	16	I.C.L.	8½	**Property**	
Barclays Bank	35	Ladbroke	20	Brit. Land	8½
Beecham	35	Legal & Gen.	38	Cap. Counties	15
Blue Circle	44	Lex Service	30	Land Sec	30
Boots	22	Lloyds Bank	45	MEPC	22
Bowaters	19	"Lots"	3½	Peachey	16
Brit. Aerospace	20	London Brick	15	Samuel Props.	10
B.A.T.	65	Lucas Inds.	15	Town & City	3
Brown (J.)	5	"Mams"	12	**Oils**	
Burton Ord	35	Mrks. & Spncr	20	Brit. Petroleum	32
Cadburys	11	Midland Bank	35	Burmah Oil	18
Courtaulds	8½	N.E.I.	10	Charterhall	5
Debenhams	12	Nat. West. Bank	50	KCA	8
Distillers	22	P & O Dfd	10	Premier	4
Dunlop	6	Plessey	50	Shell	45
Eagle Star	35	Racal Elect.	45	Tricentrol	19
F.N.F.C.	4½	R.H.M.	6	Ultramar	48
Gen. Accident	40	Rank Org. Ord	17	**Mines**	
Gen. Electric	22	Reed Intnl	28	Charter Cons.	28
Glaxo	90	Sears	9	Cons. Gold	50
Grand Met.	32	T.I.	16	Lonrho	8½
G.U.S. 'A'	55	Tesco	14	Rio T. Zinc	55
Guardian	42	Thorn EMI	50		
G.K.N.	16	Trusthouse	20		
Hawker Sidd	34	Turner & Newall	4½		
		Unilever	80		

"Recent Issues" and "Rights" Page 18

CURRENCIES, MONEY and CAPITAL MARKETS

FOREIGN EXCHANGES

Dollar strong on money supply fears

BY COLIN MILLHAM

Foreign exchanges were not particularly active last week, but trading tended to be all one way, as traders moved back into the dollar on fears that Friday's M1 money supply figures would be as disappointing as the previous week's.

The unexpectedly sharp rise in two of the three monetary aggregates published on May 13 followed earlier evidence of increased U.S. economic growth, and dashed hopes of a reduction in the Federal Reserve discount rate before the Williamsburg Summit.

Mr Paul Volcker, chairman of the Federal Reserve Board added to the general gloom about interest rates when he suggested that lower rates require a lower U.S. budget deficit, which many observers felt underlined the fading expectation of a cut in the discount rate.

As the dollar advanced, the German Bundesbank intervened to support the D-mark, but failed to prevent the U.S. currency rising to a 14-month high in Frankfurt on Thursday. It also climbed to a record level against the French franc on the same day, but retreated on Friday following a sharp drop in the April French trade deficit to FFr 1.54bn from FFr 6.58bn in March.

After a peak of FFr 7.4475 against the franc on Thursday, the dollar finished the week at FFr 7.43, compared with FFr 7.36 the previous Friday. The highest point touched against the D-mark on Thursday was around the DM 2.48 level, before closing on Friday at DM 2.4763, compared with DM 2.4440 at the end of the previous week. In terms of the Swiss franc, the dollar rose to SwFr 2.0740 from SwFr 2.0240, and against the Japanese yen to Y233.90 from Y231.90.

Opinion polls showing a large Conservative lead in the run up to the general election helped to underpin sterling, which also gained a little support from the April retail price index year-on-year rise of 4 per cent against 4.6 per cent in March. Sterling's trade-weighted index rose 0.2 to 84.1 during the week, reflecting the advance against Continental and other major currencies. The pound lost 1.10 cents to $1.5560 against the strong dollar, but improved to DM 3.8550 from DM 3.8325; to FFr 11.5650 from FFr 11.5325; to SwFr 3.22 from SwFr 3.1750; and to Y364.50 from Y363.50.

FORWARD RATES AGAINST STERLING

	Spot	1 month	3 month	6 month	12 month
Dollar	1.5560	1.5543	1.5518	1.5484	1.5436
D-Mark	3.8525	3.8338	3.8025	3.7561	3.6821
French Franc	11.56	11.5850	11.6575	11.8789	12.3401
Swiss Franc	3.2275	3.2113	3.1813	3.1399	3.0594
Japanese Yen	364.0	362.7	360.5	357.0	351.7

EMS EUROPEAN CURRENCY UNIT RATES

	ECU central rates	Currency amounts against ECU May 20	% change from central rate	% change adjusted for divergence	Divergence limit %
Belgian Franc	44.9008	45.2217	+0.71	+0.50	±1.5447
Danish Krone	8.14104	8.08486	−0.69	−0.90	±1.6425
German D-Mark	2.24184	2.26632	+1.05	+0.84	±1.0642
French Franc	6.87456	6.80281	−1.04	−1.25	±1.4052
Dutch Guilder	2.52595	2.54396	+0.71	+0.50	±1.4964
Irish Punt	0.72569	0.716877	−1.21	−1.42	±1.6699
Italian Lira	1403.49	1347.48	−3.99	−3.99	±4.1505

Changes are for ECU, therefore positive change denotes a week currency. Adjustment calculated by Financial Times.

BANK OF ENGLAND TREASURY BILL TENDER

	May 20	May 13		May 20	May 13
Bills on offer	£100m	£100m	Top accepted rate of discount	9.8470%	9.7869%
Total of applications	£345.52½m	£308m	Average rate of discount	9.8191%	9.7471%
Total allocated	£100m	£100m	Average yield	10.07%	—
Minimum accepted bid	£97.545	£97.560	Amount on offer at next tender	£100m	£100m
Allotment at minimum level	8%	79%			

OTHER CURRENCIES

May 20	£	$		£ Note Rates
Argentina Peso	122,5[illegible]-122,735	78,840-78,890	Austria	26.95-27.25
Australia Dollar	1.7625-1.7645	1.1325-1.1330	Belgium	76.55-77.50
Brazil Cruzeiro	734.50-737.50	471.95-474.29	Denmark	13.67-13.80
Finland Markka	8.4760-8.4885	5.4500-5.4520	France	11.52-11.62
Greek Drachma	128.707-132.214	83.80-84.10	Germany	3.81½-3.86½
Hong Kong Dollar	10.71-10.77	6.88-6.91	Italy	2265-2295
Iran Rial	132.50*	84.90*	Japan	363-368
Kuwait Dinar (KD)	0.4510-0.4515	0.2910-0.2915	Netherlands	4.30¼-4.34¼
Luxembourg Fr.	76.82-76.92	49.40-49.42	Norway	11.05-11.15
Malaysia Dollar	3.5750-3.5850	2.2970-2.2990	Portugal	147-168
New Zealand Dlr.	2.3475-2.3525	1.5080-1.5105	Spain	202¼-217
Saudi Arab. Riyal	5.3645-5.3700	3.4500-3.4510	Sweden	11.63-11.73
Singapore Dollar	3.2525-3.2625	2.0890-2.0910	Switzerland	3.20-3.25
Sth. African Rand	1.6805-1.6820	1.0800-1.0810	United States	1.54½-1.56½
U.A.E. Dirham	5.7095-5.7160	3.6720-3.6735	Yugoslavia	126-136

*Selling rates.

CURRENCY MOVEMENTS

May 20	Bank of England Index	Morgan Guaranty Change %
Sterling	84.1	−36.7
U.S. dollar	122.7	+12.0
Canadian dollar	90.8	−17.4
Austrian schilling	120.0	+30.0
Belgian franc	93.5	−2.0
Danish kroner	83.0	−11.1
Deutsche mark	129.0	+56.9
Swiss franc	150.5	+106.7
Guilder	117.7	+25.8
French franc	69.9	−23.4
Lira	51.8	−59.4
Yen	148.9	+42.0

Based on trade weighted changes from Washington agreement December 1971. Bank of England index (base average

CURRENCY RATES

May 19	Bank rate %	Special Drawing Rights	European Currency Unit
Sterling	—	0.695459	0.589139
U.S. $	8½	1.08150	0.915523
Canadian$	9.27	*	1.12774
Austria Sch	3¾	18.8944	15.9301
Belgian F	9½	53.4081	45.1995
Danish Kr	7½	9.53553	8.07491
D mark	4	2.67319	2.26335
Guilder	4½	3.00439	2.54012
French F	9½	8.04325	6.80785
Lira	17	1590.69	1347.42
Yen	5½	252.808	214.232
Norwgn Kr	9	7.70643	6.52356
Spanish Pta	—	149.156	126.350
Swedish Kr	8½	8.11191	6.87100
Swiss Fr	4	2.25105	1.89918
Greek Dr'ch	20½	91.0455	76.8947

*C$/SDR rate for May 19: 1.33303.

THE POUND SPOT AND FORWARD

May 20	Day's spread	Close	One month	% p.a.	Three months	% p.a.
U.S.	1.5545-1.5605	1.5555-1.5565	0.20-0.15c pm	1.35	0.45-0.40 pm	1.09
Canada	1.9130-1.9190	1.9165-1.9175	0.20-0.10c pm	0.94	0.46-0.36 pm	0.85
Nethlnd.	4.30-4.34	4.32¼-4.33¼	2-1½c pm	4.85	5-4½ pm	4.39
Belgium	76.75-77.00	76.82-76.92	8c pm-2 dis	0.47	4 pm-6 dis	−0.05
Denmark	13.71-13.76½	13.75¼-13.76¼	2½-1½ore pm	1.80	1⅝-⅞ pm	0.29
Ireland	1.2160-1.2200	1.2185-1.2195	0.43-0.55p dis	−4.82	1.23-1.44dis	−4.38
W. Ger.	3.83½-3.86	3.84¼-3.85¼	2½-1¾pf pm	5.84	5⅞-4¾ pm	5.19
Portugal	151.00-157.00	154.25-155.25	370-1540c dis	−74.05	735-2300dis	−39.22
Spain	214.80-216.30	215.25-215.45	220-300c dis	−14.49	710-805dis	−14.07
Italy	2285-2295	2287-2289	8½-10½ lire dis	−4.98	31-34 dis	−5.68
Norway	11.08-11.12	11.10½-11.11½	3¼-4¼ore dis	−3.91	9¾-10¾ dis	−3.48
France	11.55-11.58	11.55½-11.56½	2-3c dis	−2.59	9-10½ dis	−3.37
Sweden	11.64-11.67½	11.65½-11.66½	⅛-1¼ore dis	−0.96	2⅛-3⅛ dis	−0.94
Japan	362-365	363½-364½	1.35-1.15y pm	4.12	3.60-3.40 pm	3.85
Austria	27.00-27.20	27.10-27.15	14⅞-13gro pm	6.11	39⅛-34⅞ pm	5.49
Switz.	3.20-3.24	3.22¼-3.23¼	1⅞-1⅛c pm	6.04	4⅞-4⅛ pm	5.73

Belgian rate is for convertible francs. Financial franc 76.95-77.05. Six-month forward dollar 0.79-0.74c pm. 12-month 1.32-1.17c pm.

THE DOLLAR SPOT AND FORWARD

May 20	Day's spread	Close	One month	% p.a.	Three months	% p.a.
UK†	1.5545-1.5605	1.5555-1.5565	0.20-0.15c pm	1.35	0.45-0.40 pm	1.09
Ireland†	1.2750-1.2775	1.2750-1.2760	0.60-0.50c pm	5.17	1.63-1.48 pm	4.87
Canada	1.2310-1.2325	1.2310-1.2315	0.03-0.06c dis	−0.44	0.06-0.08dis	−0.24
Nethlnd.	2.7765-2.7830	2.7810-2.7830	0.87-0.77c pm	3.54	2.35-2.25 pm	3.31
Belgium	49.37-49.46	49.40-49.42	3-4½c dis	−0.91	10-13 dis	−0.93
Denmark	8.8240-8.8470	8.8370-8.8470	½ore pm-½ dis	—	¼ pm-¾ dis	−0.11
W. Ger.	2.4705-2.4785	2.4760-2.4770	0.95-0.90pf pm	4.48	2.62-2.57 pm	4.19
Portugal	98.50-99.70	99.20-99.70	250-1000c dis	−75.41	500-1500dis	−40.22
Spain	138.10-138.50	138.30-138.40	150-190c dis	−14.73	470-540dis	−14.59
Italy	1469¼-1473½	1469¼-1470¼	7½-8¼ lire dis	−6.43	24½-26 dis	−6.87
Norway	7.1290-7.1450	7.1350-7.1450	2.80-3.30ore dis	−5.13	7.80-8.30dis	−4.51
France	7.4250-7.4390	7.4275-7.4325	2.40-2.55c dis	−4.00	8.20-8.60dis	−4.52
Sweden	7.4820-7.4980	7.4920-7.4970	1.10-1.60ore dis	−2.16	3.40-3.90dis	−1.95
Japan	233.40-234.05	233.85-233.95	0.58-0.53y pm	2.84	1.69-1.61 pm	2.82
Austria	17.40½-17.44	17.41¼-17.42¼	7.40-6.60gro pm	4.82	20.50-18.00pm	4.41
Switz.	2.0620-2.0785	2.0735-2.0745	0.85-0.80c pm	4.77	2.38-2.33 pm	4.54

† UK and Ireland are quoted in U.S. currency. Forward premiums and discounts apply to the U.S. dollar and not to the individual currency. Belgian rate is for convertible francs. Financial franc 49.43-49.53.

EXCHANGE CROSS RATES

May. 20	Pound St'rling	U.S. Dollar	Deutschem'k	Japanese Yen	French Franc	Swiss Franc	Dutch Guild	Italian Lira	Canada Dollar	Belgian Franc
Pound Sterling	1	1.556	3.853	364.0	11.56	3.228	4.328	2288.	1.917	76.87
U.S. Dollar	0.643	1.	2.476	233.9	7.429	2.074	2.781	1470.	1.232	49.40
Deutschmark	0.260	0.404	1.	94.48	3.001	0.838	1.123	593.9	0.498	19.96
Japanese Yen 1,000	2.747	4.275	10.58	1000.	31.76	8.867	11.89	6286.	5.266	211.2
French Franc 10	0.865	1.346	3.333	314.9	10.	2.792	3.744	1979.	1.668	66.50
Swiss Franc	0.310	0.482	1.194	112.8	3.582	1.	1.341	708.9	0.594	23.82
Dutch Guilder	0.231	0.360	0.890	84.11	2.671	0.746	1.	528.7	0.443	17.76
Italian Lira 1,000	0.437	0.680	1.684	159.1	5.052	1.411	1.891	1000.	0.838	33.60
Canadian Dollar	0.522	0.812	2.010	189.9	6.030	1.684	2.257	1194.	1.	40.10
Belgian Franc 100	1.301	2.024	5.012	473.5	15.04	4.199	5.630	2976.	2.494	100.

MONEY MARKETS

Almost grinding to a halt

Interest rates had a slightly firmer tone on the London money market last week, but this was mainly a defensive reaction to the uncertainty generated on both sides of the Atlantic.

A large lead for the Conservatives in the opinion polls soothed the market for most of the week, but with about three weeks still to go to polling day, there was no enthusiasm to look very far ahead, and interest rates settled down to a general blanket level of around 10⅛ per cent. The gentle reverse yield curve, which has been a market norm for some time, also disappeared as longer term rates moved higher to give a completely flat structure to the market.

Confidence may have been at a higher level if the economic statistics from the U.S., including money supply figures, had been less disconcerting. Signs of an upturn in U.S. economic activity alone, may not have alarmed the market. Providing this was not accompanied by signs of overheating there was every reason to hope that the U.S. Administration would be keen to reduce interest rates ahead of the Williamsburg Summit.

Speculation increased that the Federal Reserve discount rate would be cut, but as on previous occasions, the optimists seemed to be left viewing another false dawn for lower world interest rates. M2 growth of $5.4bn in April was in line with expectations, but the rise in M3 of $9bn, and a weekly increase of $4.2bn in the narrow based M1 figure came as a shock, and left the market very nervous about last Friday's M1 announcement.

London's financial markets almost ground to a halt against a background of political nervousness in the UK and uncertainty about monetary policy in the U.S. The money market was flat, gilts becalmed, while on the London International Financial Futures Exchange, dealers spoke of stalemate. Activity held at reasonable levels only because of the approaching June settlement date, which encouraged operators to roll positions forward to September.

Wednesday was make-up day for the London banks, but this passed without much note as the authorities showed an obvious willingness to provide all the help required.

LONDON MONEY RATES

May 20 1983	Sterling Certificate of deposit	Interbank	Local Authority deposits	Local Auth. negotiable bonds	Finance House Deposits	Company Deposits	Discount Market Deposits	Treasury Bills ♦	Eligible Bank Bills ♦	Fine Trade Bills ♦
Overnight	—	9-11	10¼-10⅝	—	—	10⅛	9¾-10¾	—	—	—
2 days notice	—	—	10⅛-10¼	—	—	—	—	—	—	—
7 days or	—	—	—	—	—	—	—	—	—	—
7 days notice	—	10¼-10½	10¼	—	—	10½	10-10⅛	—	—	—
One month	10⅛-10 1/16	10¼-10 1/16	10¼	10¾-10⅛	10 5/16	10¼-10⅝	10	10-10 1/32	10 1/16	10 3/16
Two months	10⅜-10⅛	10¼-10 1/16	10¼	10⅝-10⅜	10⅜	10⅝	9⅞	9 31/32	9 15/16	10 1/16
Three months	10 3/16-10 1/16	10¼-10 1/16	10¼	10⅝-10¼	10 3/16	10⅝	9¾-9⅞	9 27/32-9⅞	9 29/32	10 1/16
Six months	10 3/16-10 1/16	10¼-10 1/16	10¼	10½-10⅛	10 3/16	—	—	—	9 15/16-9¾	10⅛
Nine months	10¼-10⅛	10¼-10 3/16	10⅜	10⅝-10¼	10 3/16	—	—	—	—	—
One year	10 3/32-10⅛	10⅜-10½	10⅜	10½-10¼	10 3/16	—	—	—	—	—
Two years	—	—	10⅞	—	—	—	—	—	—	—

ECGD Rate Export Finance Scheme IV Average Rate for interest period April 6 to May 3 1983 (inclusive): 10.304 per cent.

Local authorities and finance houses seven days' notice, others seven days fixed. Long-term local authority mortgage rates nominally three years 11 per cent; four years 11¼ per cent; five years 11½ per cent. ♦Bank bill rates in table are buying rates for prime paper. Buying rates for four-month bank bills 9 25/32-9 23/32 per cent; four months trade bills 10⅛ per cent.

Approximate selling rate for one month Treasury bills 9 29/32-10 per cent; two months 9 13/16-9 29/32 per cent; three months 9¾-9 23/32 per cent. Approximate selling rate for one month bank bills 10 1/32 per cent; two months 9⅞-9 59-64ths per cent and three months 9 27/32-9 55-64ths per cent; trade bills one month 10 7/16 per cent; two months 10 3/16 per cent and three months 10 3/16 per cent.

Finance Houses Base Rates (published by the Finance Houses Association) 11 per cent from May 1 1983. London and Scottish Clearing Bank Rates for lending 10 per cent. London Deposit Rates for sums at seven days' notice 6¾ per cent.

Treasury Bills: Average tender rates at discount 9.8191 per cent. Certificates of Tax Deposit (Series 6). Deposits of £100,000 and over held one month 10½ per cent; one-three months 10⅜ per cent; three-six months 10¼ per cent; six-12 months 10⅛ per cent. Under £100,000 10 per cent from April 8. Deposits held under Series 3-5 10⅛ per cent. The rates for all deposits withdrawn for cash 8 per cent.

INTEREST RATES

EURO-CURRENCY INTEREST RATES (Market closing rates)

May 20	Short term	7 days notice	Month	Three Months	Six Months	One Year
Sterling	10¼-10⅜	10¼-10⅜	10 3/16-10 5/16	10 3/16-10 5/16	10 3/16-10 5/16	10⅜-10½
U.S. Dollar	8⅝-8⅞	8¾-9	8⅞-9⅛	9 1/16-9 3/16	9 3/16-9 5/16	9 5/16-9 7/16
Can. Dollar	10-11	9¼-10	9 3/16-9 7/16	9 3/16-9 7/16	9 5/16-9 9/16	9½-9¾
D. Guilder	5-5¼	5⅜-5⅝	5 7/16-5 9/16	5¾-5⅞	5⅞-6	6 1/16-6 3/16
S. Franc	2¾-3	3-3½	4⅜-4⅝	4 5/16-4 7/16	4 5/16-4 7/16	4 5/16-4 7/16
Deutschm'rk	4 5/16-4 7/16	4¾-4⅞	4⅞-5	4 15/16-5 1/16	5⅛-5¼	5½-5⅝
Fr'nch Franc	12¼-12¾	12¼-12¾	12¼-12⅝	13⅝-13⅞	16-16½	17¼-17¾
Italian Lira	14-15½	14⅝-16	15-15⅝	16¾-16¼	17-17½	18⅜-19⅛
Belg. Franc Conv.	9¼-9¾	9½-10	9¾-10¼	10-10½	10¼-10¾	10⅛-11
Fin.	9½-10	9¾-10	9⅞-10⅛	10-10¼	10⅛-10⅜	10¼-10½
Yen	6-6⅛	6 1/16-6 3/16	6¼-6⅜	6 5/16-6 7/16	6 5/16-6 7/16	6⅜-6½
D. Krone	4½-5	5¼-6¼	8¼-8¾	9¼-9¾	10½-11	11-11½
Asia $ (Sing.)	8 5/16-9 1/16	8 13/16-9 1/16	9 1/16-9 3/16	9 1/16-9 3/16	9 3/16-9 5/16	9⅜-9½

FT LONDON INTERBANK FIXING

(11.00 a.m. MAY 20)

3 month U.S. dollars		6 months U.S. dollars	
bid 9 1/8	offer 9 1/4	bid 9 1/4	offer 9 3/8

The fixing rates are the arithmetic means, rounded to the nearest one-sixteenth, of the bid and offered rates for $10m quoted by the market to five reference banks at 11 am each working day. The banks are National Westminster Bank, Bank of Tokyo, Deutsche Bank, Banque Nationale de Paris and Morgan Guaranty Trust.

MONEY RATES

NEW YORK

Prime rate	10½
Fed funds (lunch-time)	8½-8⅝
Treasury bills (13-week)	8.16
Treasury bills (26-week)	8.25

GERMANY

Lombard	5.0
Overnight rate	5.025
One month	5.25
Three months	5.30
Six months	5.35

FRANCE

Intervention rate	12.5
Overnight rate	12.5
One month	12.5
Three months	12.5
Six months	12.625

JAPAN

Discount rate	5.5
Call (unconditional)	5.59375
Bill discount (3-month)	6.59375

SWITZERLAND

Discount rate	4
Overnight rate	2-3
One month	4⅝-4¾
Three months	4⅝-4¾

NETHERLANDS

Discount rate	4½
Overnight rate	5¼-5½
One month	5⅛-5¼
Three months	5½-5⅞
Six months	5⅞-6⅛

$ CERTIFICATES OF DEPOSIT

One month	8.75-8.85
Three months	8.80-8.90
Six months	9.00-9.10
One year	9.15-9.35

LONG TERM EURO $

Two years	10-10¼
Three years	10⅝-10⅞
Four years	11-11¼
Five years	11¼-11½

SDR LINKED DEPOSITS

One month	8 7/16-8 9/16
Three months	8⅞-8⅝
Six months	8¾-9
One year	8 15/16-9 1/16

ECU LINKED DEPOSITS

One month	8¼-8⅝
Three months	8¾-9
Six months	9¼-9⅝
One year	9 13/16-10 3/16

FINANCIAL FUTURES

LONDON

THREE-MONTH EURODOLLAR $1m points of 100%

	Close	High	Low	Prev
June	90.95	90.99	90.90	91.02
Sept	90.71	90.74	90.66	90.80
Dec	90.48	90.48	90.43	90.57
March	90.24	90.24	90.21	90.35
June	90.00	90.00	89.98	90.11

Volume 1,736 (1,541)
Previous day's open int. 4,404 (4,264)

THREE-MONTH STERLING DEPOSIT £250,000 points of 100%

	Close	High	Low	Prev
June	89.93	89.94	89.88	89.94
Sept	90.11	90.11	90.05	90.12
Dec	90.07	90.07	90.00	90.04
March	89.90	89.90	89.84	89.96
June	89.70	—	—	89.75

Volume 528 (819)
Previous day's open int. 3,588 (3,569)

20-YEAR 12% NOTIONAL GILT £50,000 32nds of 100%

	Close	High	Low	Prev
June	103-27	104-02	103-25	104-03
Sept	103-17	103-23	103-16	103-24
Dec	105-08	105-08	105-03	105-12
March	104-20	104-20	104-20	105-00
June	104-10	104-10	104-10	104-22

Volume 1,019 (1,960)
Previous day's open int. 3,641 (3,589)
Basis quote (clean cash price of 15¼% Treasury 1998 less equivalent price of near futures contract) par to 6 (32nds).

STERLING £25,000 $ per £

	Close	High	Low	Prev
June	1.5580	1.5600	1.5543	1.5549
Sept	1.5543	1.5563	1.5502	1.5504
Dec	1.5513	1.5513	1.5481	1.5474

Volume 1,366 (356)
Previous day's open int. 2,091 (2,105)

DEUTSCHE MARKS DM 125,000 $ per DM

	Close	High	Low	Prev
June	0.4046	0.4050	0.4043	0.4053
Sept	0.4083	0.4084	0.4087	0.4096
Dec	—	—	—	—

Volume 65 (316)
Previous day's open int. 638 (643)

SWISS FRANCS SwFr 125,000 $ per SwFr

	Close	High	Low	Prev
June	0.4830	0.4845	0.4830	0.4856
Sept	0.4896	—	—	0.4921
Dec	—	—	—	—

Volume 16 (67)
Previous day's open int. 477 (493)

JAPANESE YEN Y12.5m $ per Y100

	Close	High	Low	Prev
June	0.4282	0.4298	0.4277	0.4281
Sept	0.4313	—	—	0.4313
Dec	—	—	—	—

Volume 54 (278)
Previous day's open int. 379 (314)

CHICAGO

U.S. TREASURY BONDS (CBT) 8% $100,000 32nds of 100%

	Close	High	Low	Prev
June	76-10	76-27	76-02	76-15
Sept	75-23	76-07	75-15	75-28
Dec	75-06	75-22	75-00	75-12
March	74-24	75-06	74-16	74-30
June	74-11	74-27	74-06	74-18
Sept	74-00	74-16	73-28	74-07
Dec	73-23	74-04	73-22	73-30
March	73-15	73-21	73-14	73-22
June	—	—	—	—
Sept	—	—	—	—
Dec	—	—	—	—

U.S. TREASURY BILLS (IMM) $1m points of 100%

	Close	High	Low	Prev
June	91.66	91.74	91.64	91.68
Sept	91.45	91.54	91.44	91.47
Dec	91.23	91.31	91.23	91.24
March	91.03	91.10	91.03	91.04
June	90.86	90.90	90.85	90.87
Sept	90.68	90.70	90.68	90.69
Dec	90.49	90.51	90.49	90.51
March	90.33	—	90.33	90.36

CERT. DEPOSIT (IMM) $1m points of 100%

	Close	High	Low	Prev
June	91.18	91.24	91.16	91.18
Sept	90.90	90.96	90.88	90.88
Dec	90.64	90.68	90.64	90.62

THREE-MONTH EURODOLLAR (IMM) $1m points of 100%

	Close	High	Low	Prev
June	90.64	90.72	90.61	90.67
Sept	90.39	90.49	90.39	90.40
Dec	90.18	90.22	90.17	90.17
Feb	—	—	—	—
March	89.94	90.01	89.94	89.95

STERLING (IMM) $s per £

	Close	High	Low	Prev
June	1.5540	1.5600	1.5530	1.5525
Sept	1.5495	1.5560	1.5485	1.5480
Dec	1.5470	1.5590	1.5480	1.5455
March	1.5460	1.5530	1.5480	1.5435
June	—	—	—	—
Sept	—	—	—	—

GNMA (CBT) 8% $100,000 32nds of 100%

	Close	High	Low	Prev
June	69-24	70-06	69-15	69-28
Sept	69-01	69-16	68-26	69-06
Dec	68-12	68-27	68-07	68-18
March	67-26	68-08	67-20	67-30
June	67-11	69-01	67-06	67-16
Sept	66-30	67-08	66-26	67-04
Dec	66-19	66-28	66-17	66-26
March	—	—	—	—
June	—	—	—	—
Sept	—	—	—	—
Dec	—	—	—	—

WEEKLY CHANGE IN WORLD INTEREST RATES

	May 20	change		May 20	change
LONDON			**NEW YORK**		
Base rates	10	Unch'd	Prime rates	10½	Unch'd
7 day interbank	10¼-10½	−⅛	Federal funds	8¼-8⅝	+⅛
3 mth interbank	10¼-10 1/16	Unch'd	3 mth Treasury Bills	8.16	+0.15
Treasury Bill Tender	9.8191	+0.0720	6 Mth. Treasury Bills	8.25	+0.24
Band 1 Bills	10 1/16	Unch'd	3 Mth. C D	8.70	+0.20
Band 2 Bills	10	Unch'd	**FRANKFURT**		
Band 3 Bills	9 15/16	Unch'd	Lombard	5.00	Unch'd
3 Mth. Treasury Bills	9 27/32-9⅞	+⅛	One Mth. interbank	5.25	+0.05
1 Mth. Bank Bills	10 1/16	Unch'd	Three month	5.30	+0.10
3 Mth. Bank Bills	9 29/32	+1/32	**PARIS**		
TOKYO			Intervention Rate	12½	Unch'd
One month Bills	6.46875	Unch'd	One Mth. interbank	12½	−1/16
Three month Bills	6.59375	−0.0625	Three month	12½	−⅛
BRUSSELS			**MILAN**		
One month	10	+1/32	One month	17 5/16	Unch'd
Three month	10⅛	+3/32	Three month	17 13/16	Unch'd
AMSTERDAM			**DUBLIN**		
One month	5 3/16	+⅛	One month	14⅝	−⅛
Three month	5¾	+¼	Three month	14½	−¼

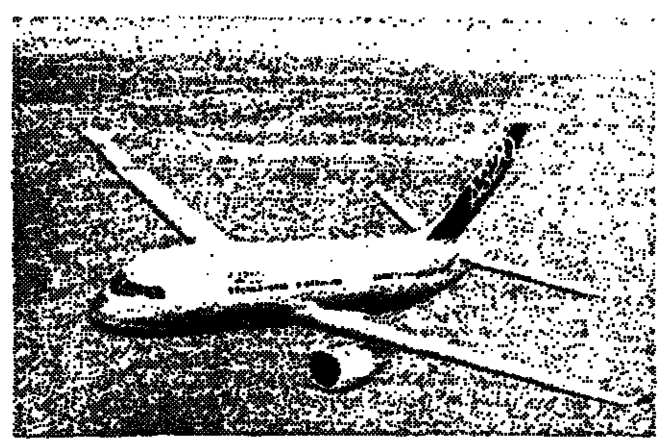
London—band 1 bills mature in up to 14 days, band 2 bills 15 to 33 days, and band 3 bills to 63 days. Rates quoted represent Bank of England buying or selling rates with the money market. In other centres rates are generally deposit rates in the domestic money market and their respective changes during the week.

SECTION III

FINANCIAL TIMES SURVEY

AEROSPACE

The recession has severely depressed commercial airliner sales, but other areas of world aerospace, such as military and space activities, have remained remarkably buoyant. The overall outlook is for business worth over $500bn. throughout the next decade



Two prospective new international projects seem likely to dominate the European aerospace industry through the rest of this century. One is the A-320 150-seater version of the European Airbus (above). The other is the advanced Agile Combat Aircraft (ACA) (below) for which a "technology demonstrator," called the Experimental Aircraft Project (EAP), is to be built

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Airlines and airports

Military and Space

Editorial production: Michael Strutt
Layout: Phil Hunt

Waiting for the world recovery

BY MICHAEL DONNE, AEROSPACE CORRESPONDENT

THE WORLD'S aerospace industries go to the Paris International Air Show this week hopeful that the signs of an improvement in the world economic situation in recent weeks do indeed presage a recovery in their own fortunes.

Although the aerospace community as a whole has weathered the recession better than many other industries, it *has still suffered severely*, especially in civil airliner and engine manufacture.

Activity in the military aircraft sector has remained more buoyant, stimulated by continued demand for combat air-*craft, engines and guided* missiles in many countries, particularly in the Developing World. Even here, however, the activity has stemmed more from the continuation of major programmes (such as the Tornado multi-role combat aircraft in Western Europe) begun before the recession struck, than from new programmes subsequently initiated.

Moreover, even the military market has been characterised by a marked intensification of competition for the few new orders prevailing, and this situation shows no signs of diminishing.

There is little doubt that in *many companies in the U.S. and* Western Europe where both civil airliner and military aircraft manufacture are undertaken, the profits earned on the military side have been supporting the civil operations. This seems likely to continue, at least until demand for commercial aircraft has recovered sufficiently to enable airliner production to stand on its own feet again.

At the same time, the space sector has been developing rapidly, with *rising demand for* satellites of all kinds, but especially for telecommunications (including direct broadcasting), weather forecasting and Earth resources monitoring —the three big areas of space expansion. Demand for satellites and their supporting ground installations is forecast to amount to between $20bn and $30bn, up *to* the end of this century.

There is no doubt that the commercial airliner and engine manufacturers have passed through the worst two to three years in their history. During 1982, the total of new jet airliners of all kinds ordered world-wide amounted to only 223, worth about $5.35bn, well *down on the total of* 332 ordered in 1981, and less than a third of the total ordered in the late 1970s, when the annual rate was 700 to 800 aircraft a year.

The effects have been traumatic, with labour lay-offs running through the entire aerospace industry, through to the myriad component and equip-*ment contractors in associated* industries. These cuts have been especially severe in the aero-engine industry, and again especially in Rolls-Royce, where the redundancies continue, with another 6,000 due to be laid off this year, on top of those laid off in 1981 and 1982.

But despite the difficulties of the past two to three years, and the probability that the inflow of new orders will remain low until the airlines have substantially re-established their financial situation on a sounder basis, the manufacturers remain optimistic for the long-term.

Demand

Airbus Industrie, the European airliner manufacturing group *in which* British Aerospace has a 20 per cent stake, believes that the total market for new jet airliners between now and the end of this century is likely to amount to 6,700 aircraft, worth about $275bn. Airbus aims to win about 34 per cent of this market, or over $90bn worth of business.

Boeing of the *U.S.*, the world's biggest jet airliner manufacturer, believes that between 1983 and 1995, there will be a demand for about 4,220 new jets, worth some $167bn.

Douglas Aircraft. the airliner building division of McDonnell Douglas of the U.S. believes that the world's airlines will need about 5,000 new aircraft between now and 1995, although it does not put a cash value on that figure.

On the engine side, Pratt & Whitney is even more optimistic, believing that total demand for airliners of all kinds could reach as high as 10,000 by the end of the *century, although this figure* includes smaller transports in the so-called "commuter" or "third-level" aviation category.

All these forecasts broadly agree that *once the recession is* over, a major upsurge in demand for civil aircraft will emerge. It will stem not only *from a revival of traffic growth* (with an annual average increase of about 6 per cent) but also from the need to replace existing ageing and fuel-inefficient fleets, while new noise regulations becoming effective in about 1985-86 in the U.S. and Western Europe, including the UK, will render obsolete some older jets, requiring new orders as a matter of urgency in *some* countries.

Even if the manufacturers' forecasts prove to have been over-optimistic, it does seem likely that the world's aerospace industries will face a substantial volume of business through the rest of this decade and through to the end of the century.

Apart from the Boeing forecast of $167bn worth of "front-line" airliner business, it is estimated that demand for civil and *military helicopters could* amount to some $36bn over the years ahead. To this should be added the possibility of at least some $20bn of new business over the next decade in the "general aviation" category (*that* is, *covering* all kinds of aircraft outside the airliner and helicopter fields, including business aircraft and private and leisure demands), together with at least another $15bn for "commuter airliners."

The U.S. General Aviation Manufacturers' Association believes that forecast increases in U.S. Gross National Product, corporate spending and corporate profits in 1983, all promise a rising trend of busi-*ness that* will continue through the 1980s.

Collectively, therefore, the volume of aircraft and engine business through the 1980s *could* amount to well over $230bn, and this figure might prove to be conservative if the recovery from the recession is *swifter and stronger than many* currently dare hope.

If to this is added space business, a collective volume of over $250bn of commercial aerospace business worldwide seems not unreasonable during the coming *decade. Military business*, forecast to run at anything between $25bn and $30bn a year through the next decade, or a total of up to $250bn-$300bn, means that overall the world's aerospace industries can expect business of over $500bn through the next decade.

Redundancies

The manufacturers' main problem is that they have to survive over the next year or two — a period of lower production activity reflecting the low level of orders of recent years. *New orders* booked either this year or next are not likely to be reflected on production lines until late 1984 or early 1985, unless empty slots have been left specifically for that purpose, and there may even have to be further redundancies in the manufacturing industry later this year.

One of the major outstanding decisions in the commercial airliner field is whether or not any one, or all, of the major manu-*facturers will formally* launch soon the development of a new, so-called "150-seater" jet airliner, for service from the late 1980s. All the major companies have been undertaking studies —Boeing with its "7 Dash 7," 737-400 and short-fuselage 757 concepts, Airbus Industrie with the A-320, and McDonnell Douglas with its D-3300-1—and combined research and development spending on these designs now probably runs well over $100m.

If Airbus Industrie were to formally launch the A-320 this year, Boeing would probably immediately counter with its 737-400, which it believes it could put into the market by 1987, beating Airbus, and at a cheaper price.

A similar situation exists with the engine. So far, the earliest available engine would be the *Franco-U.S.* (General Electric-Snecma) CFM-56 in its Dash 4 version, which Airbus is already discussing for its A-320, while Boeing would also use it in the 737-400.

This would be available earlier than the all-new, advanced technology engine for the new generation of 150-seaters, which is now being planned by Rolls-Royce *and Pratt* and *Whitney* in conjunction with the three Japanese aero-engine companies (Ishikawajima-Harima Heavy Industries, Kawasaki Heavy Industries and Mitsubishi Heavy Industries) along with Motoren und Turbinen Union of West Germany and Fiat Aviazione *of* Italy.

The aim is to get the new engine, which will cost upwards of $1.5bn to develop, certificated by late 1987, but if there are any difficulties over the anti-trust laws, the starting date could slip, putting the engine back to 1988-89 or even later. Many believe that this would be a more realistic target date, anyway, again because of the need for a major recovery in the fortunes of the world's airlines.

The new engine and new airframe would then be able to come together for the early 1990s, when overall economic conditions would be likely to be more favourable for the placing of orders by the airlines.

The sizes of the investments *involved — $1.5bn on a new* engine, and up to $2bn each for any of the rival airframes

CONTINUED ON NEXT PAGE

Fierce battles in engines market

"... the major aero-engine companies are turning increasingly to international collaboration to spread the burden of development costs and so widen the potential market."

ALL THREE of the world's major aero-engine builders—Rolls-Royce, and General Electric and Pratt & Whitney of the U.S.—have suffered along with the rest of the aerospace industry from the cuts in orders stemming from the financial difficulties of the world's airlines. Over the past two years or more they have been obliged to rely substantially on military business.

There are now signs that some time over the next year or so this situation may change, and that demand for commercial engines will recover sufficiently to enable the manufacturers to look with more confidence to the future.

While over the long-term, the engine builders share their air-frame counterparts' belief that business will expand as world air traffic grows, bringing with it a new demand for airliners of all kinds, civil work-loads for the immediate future seem likely to remain low.

Confident

Despite their problems, all of the big three engine builders remain confident about the long-term future for their industry, despite the current difficulties.

Pratt and Whitney, for example, believes that the airline industry is heading for another upturn in business through the 1980s. Last year, deliveries of new jet airliners from all sources were below 300, and the excess aircraft capacity currently in the market will continue for another two years. But from 1985 on the forecast is positive, with deliveries rising to about 500 aircraft a year by 1989, and then continuing at the 500-plus a year level through to the end of the century.

The airlines, in Pratt and Whitney's view, are likely to need up to 10,000 new aircraft by the year 2000, of which about 4,000 will be needed over the next ten years — comprising 2,400 narrow-bodied jets for short-range work, about 1,200 medium-range wide-bodies and 400 long-range wide-bodies. This will generate a demand for about 25,000 engines by the end of this century, of which close to half (or about 11,600 engines) will be needed by the end of this decade, as the chart shows.

With such a sizeable market, there should be room for all three major manufacturers, but whether all of them can continue to build engines across the wide spectrum of types that are currently on offer or projected remains to be seen. Aero-engine investment is expensive—any new engine can cost upwards of $1.5bn to develop, with the result that, as in airframes, the tendency is more towards derivatives of what is already available, rather than entirely new power-plants.

This massive investment requirement is likely to test the courage and stamina of Rolls-Royce and its sole shareholder, the British Government, severely in the immediate future because of the major investments that will be needed to sustain the Rolls-Royce programme across the wide range of its activities.

Rolls-Royce managed a marginally higher turnover in 1982 at £1.49bn, but this disguised a substantial fall in available work, stemming from the recession in airline business.

While the company's longer-established engines, such as the civil Spey jet, Dart turbo-prop, the Viper for business jets, and the Adour for military aircraft remained profitable and substantial businesses (as did the Pegasus for Harrier vertical take-off aircraft and the RB-199 for the Tornado multi-role combat aircraft), Rolls-Royce was geared to produce in the early 1980s more than 300 large-fan engines of the RB-211 type each year.

As a result of the recession, estimates have been progressively revised downwards, and the latest forecast is that fewer than only quarter of this figure will be produced in 1983. This lack of demand for the large civil engines, and a lower than expected requirement for spares, has reduced inventories and lead times, producing a reduction in work-load and a consequent reduction in employment.

This situation illustrates clearly the dilemma facing the company, and indeed all major world aero-engine manufacturers. The costs of developing a new engine are very high, often running into hundreds of millions of pounds, and the rewards are often substantially delayed, perhaps not emerging for seven to 10 years after initial launch of the project.

At the same time, since most of the "big three" areo-engine builders are involved in a wide range of engines across the range and payload spectrum, they often have many hundreds of millions of pounds at risk with no guarantee of profits, even after many years.

Moreover, to try to remain in this business requires a continued injection of new research and development finance, on which the return can by no means be guaranteed. Rolls-Royce's own R and D injection of £131m last year is only one company's outlay for one year. For the aero-engine industry as a whole world-wide, the R and D outlay probably runs to well over £1bn, with no guarantees of profits.

WORLD COMMERCIAL TURBINE MARKET ENGINES AND SPARE PARTS 1984-93	U.S. market		Non-U.S. mkt.		World mkt.	
Aircraft type	Units	$bn 1984	Units	$bn 1984	Units	$bn 1984
Long range	550	5.0	2,500	20.0	3,050	25.0
Medium-short range twin aisle	1,050	8.0	2,100	14.5	3,150	22.5
Medium-short range single aisle	2,250	10.0	3,150	12.0	5,400	22.0
Total market	3,850	23.0	7,750	46.5	11,600	69.5

Source: Pratt and Whitney Aircraft (United Technologies) U.S.

It is for this reason that the major aero-engine companies are turning increasingly to international collaboration to spread the burden of development costs and so widen the potential market.

Rolls-Royce for many years has been involved in international collaboration on a wide range of aero-engine programmes, both civil and military, especially with the aero-engine builders in Western Europe, although this has not prevented the company from undertaking private-venture developments in areas where it believes it has a chance of reaping adequate rewards.

Potentially one of the most significant long-term developments in world aero-engine affairs, however, has been the provisional agreement between Rolls-Royce, Pratt & Whitney of the U.S., and other aero-engine companies in Japan Ishikawajima-Harima Heavy Industries, Kawasaki Heavy Industries and Mitsubishi Heavy Industries), West Germany (Motoren and Turbinen Union) and Italy (Fiat Aviazione), to collaborate on the development of a new engine in the 20,000 lb to 30,000 lbs thrust class, for any new generation of short-range 150-seater jets and for other aircraft types, that may emerge in the mid to late 1980s.

This agrement, which followed many months of negotiation between the partners, is still the subject of approval by the shareholders of the companies concerned, which in the UK means the Government.

The Rolls-Royce-Pratt and Whitney plan envisages those two companies each having 30 per cent of the work (and each putting up 30 per cent of the cash), with the remaining 40 per cent being shared by the other companies, the three Japanese companies jointly having the biggest share. The aim is to settle details of the work and cost-sharing programme over the next few weeks, for final agreement by June 30.

At that time a new joint company, International Aero-Engines, will be formed to become responsible for the design, development, manufacture, marketing and in-service support of the engine over its life, which could extend to more than 20 years.

The new engine will be based substantially upon technology developed by Rolls-Royce and its three Japanese partners for the RJ-500 engine programme, of which two demonstrator engines have already been built, as well as on technology evolved by Pratt & Whitney in its own PW-2037 engine programme.

Should the international venture still fail to emerge, Rolls-Royce and the Japanese makers probably would revert to work on the RJ-500 while Pratt & Whitney would develop a new engine of its own, based on its PW-2037 technology.

While this collaboration is evolving, however, the competition between all three major world aero-engine manufacturers continues unabated, in both the civil and military fields. In the commercial engine field, Rolls-Royce, with its Dash 535 version of the RB-211, has a head-start over Pratt and Whitney in powering the new Boeing 757 twin-engined short-range jet airliner, but Pratt and Whitney is now emerging rapidly with its PW-2037, which will power Delta Air Lines' 757s.

Major rivalry between these two companies is likely through the rest of this decade, with these engines, both of which can be expected to be developed further in the battle for orders. Already Rolls-Royce has developed a follow-on version, the 535-E4, with even further improved fuel economy over the existing 535C. The E4, with 40,100 lbs thrust at take-off (against the 37,400 lbs thrust for the 535C) is due into airline service next year.

Beyond that, further development of the 535 to higher thrusts are planned for a wide range of airliner applications, including the H4 version of up to 41,500 lbs thrust for future long-range aircraft, such as new developments of the McDonnell Douglas DC-10 tri-jet (the MD-EEE), and possibly even the Boeing 747 Jumbo jet. Rolls-Royce is gearing much of its future to the 535 engine.

At the upper end of the thrust-scale, Rolls-Royce faces considerable competition with the 524 version of the RB-211 from the recently-announced Pratt & Whitney PW-4000 series of engines and from new developments in the General Electric CF6-80 series.

Fuel savings

The PW-4000 series of engines is designed to give substantially better fuel consumption over existing "big thrust" engines, together with considerable savings in maintenance costs stemming from fewer working parts. The series will include engines between 48,000 lb and 60,000 lb thrust and the first engine will be ready by July 1986.

Aircraft for which it will be suitable will include both current and derivative versions of the Boeing 747 Jumbo, the Boeing 767 wide-bodied twin-engined short-to-medium-range airliner, and the Airbus A-300 and A-310 wide-bodied jets.

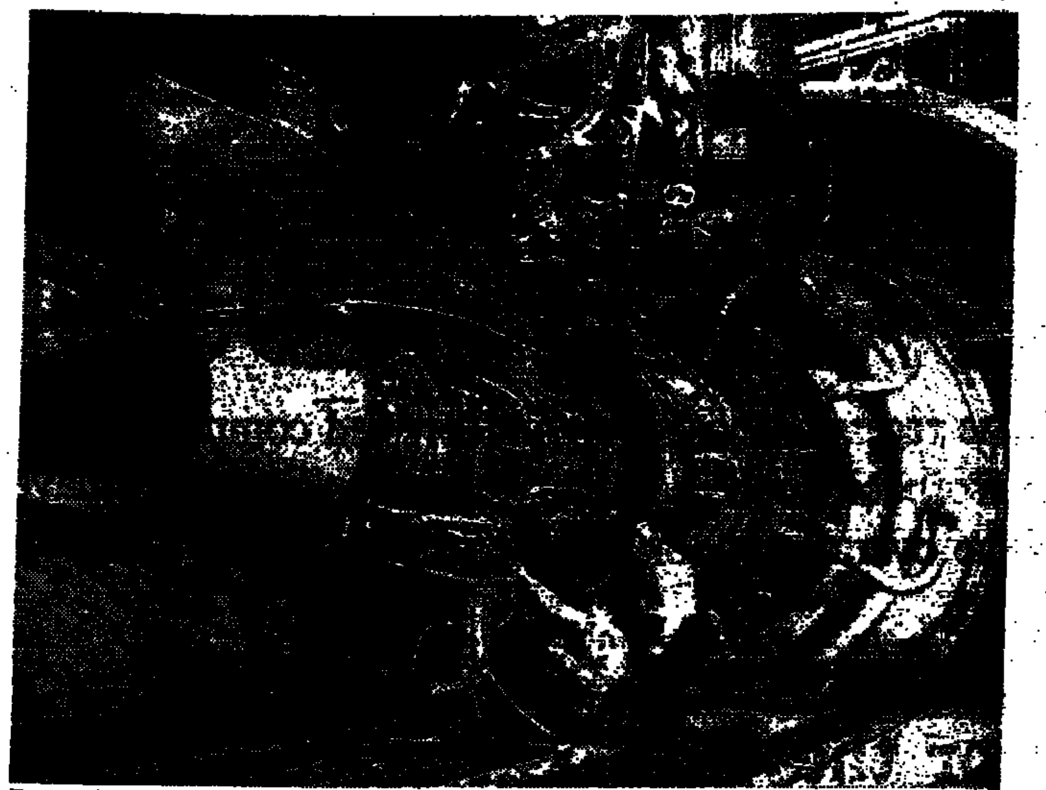
Rolls-Royce remains calm in the face of the Pratt & Whitney threat. It has now begun discussions with world airlines and aerospace manufacturers on the possibility of developing a new version of the RB-211, the series 600, which could have a thrust higher than the 53,000 lb of the D4 version of the RB-211-524 which is about to enter service.

This new version of the RB-211-524 would also be suitable to compete with engines from General Electric, the third of the "big three" in the world aero-engine business. General Electric has established a strong competitive base against Pratt & Whitney in the A-300, A-310 and 747 markets with its CF6-50 series of "big thrust" power-plants.

The overall CF6-50 series of engines already powers more than 1,000 aircraft (either in service, on order or on option), and General Electric is now developing its latest variant, the CF6-80C, rated at 56,000 lbs to 62,000 lbs thrust, for certification in June 1985.

General Electric says this engine is intended for various commercial applications, including the improved Airbus A-300-600, the stretched upper deck version of the Boeing 747, and stretched derivatives of the 767. General Electric argues that far from being an entirely new initiative, the Pratt & Whitney PW-4000 series is in effect "a response" by Pratt & Whitney to GE's own CF6-80C, "which has already demonstrated in excess of 62,000 lbs thrust and the lowest fuel consumption of any commercial engine in its thrust class".

Michael Donne



Pratt and Whitney's PW-2037 engine in altitude test chamber at the company's plant at East Hartford, Conn., U.S. This engine is P and W's answer to the Rolls-Royce RB-211-535 in the Boeing 757 airliner.

Wait for recovery

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(A-320 "7 Dash 7," D-3300-1) makes the whole question of timing a matter of vital importance.

On the military side, the major question poised over Western Europe is when to launch a new international advanced combat fighter programme, so as to replace by the end of this decade or early in the next the current Jaguar jet strike-trainers in the RAF and French air force and Phantom jets in the West German Luftwaffe.

Contributions

Currently, the UK Ministry of Defence is helping to finance, with contributions from the industry, the development of a "technology demonstrator," called the Experimental Aircraft Programme (EAP), from which it is hoped eventually will emerge a new advanced Agile Combat Aircraft (ACA). It is also hoped that eventually the development of this aircraft will become an international affair, with the West German industry and perhaps also Italian manufacturers joining in, as they did on the Tornado multi-role combat aircraft.

The likelihood of the French aerospace industry and air force also participating seems remote, since France has already embarked on its own advanced combat venture, the ACX or Avion de Combat Experimental.

British Aerospace and its partners in the engine and equipment industry (Rolls-Royce, Marconi Avionics, Smiths Industries, Dowty Group Ferranti and Lucas Aerospace) have been negotiating with the Ministry of Defence on the detailed contract for the development of the EAP "technology demonstrator," and a contract is expected to be signed soon.

The Government's contribution is expected to be about £60m to £70m, covering airframe, engine, avionics and equipment, with substantial funds coming from the equipment and other contractors (who have already spent about £25m of their own money on the venture).

These two major programmes—the prospective 150-seater airliner and the future European combat aircraft—together represent the biggest individual aircraft ventures likely to be undertaken in Western Europe throughout the next decade, and as such are of great importance not only to the airframe and engine industries, but also to a wide range of sub-contractors, equipment, component and material manufacturers.

Manufacturers desperate for orders

Every potential contract is heavily contested with a ferocity that has surprised many in the industry worldwide.

ALTHOUGH THERE may be some slight signs of an economic upturn in the U.S., the immediate outlook for the world's major airliner manufacturers remains bleak, as the airlines continue to hold back from placing the orders for new equipment that the makers desperately need to keep their production lines busy.

The *extent of the recession* the jet builders have experienced over the last two years can be gauged from the fact that during 1982, the total of new jet airliners of all kinds ordered reached *only* 223, worth about $5.35bn, well down on the total of 332 new jets ordered in 1981, and less than a third of the total ordered in the late 1970s, when the annual number was between 700 and 800 aircraft.

Hoping

Overall, the three major manufacturers — Airbus Industrie in Western Europe, and Boeing and McDonnell Douglas of the U.S. (who between them account for the bulk of all airliner sales) — are desperately hoping that the signs of overall economic recovery emerging so far this year will prove to be lasting, and that better times may be on the way.

With few big orders immediately in prospect, and most new contracts involving small numbers of aircraft requiring *substantially* increased *efforts* to win, the big jet airliner builders will have to live off their accumulated backlogs through 1983 and 1984, pending any significant upturn in the airlines' fortunes that will encourage them to place new orders.

There are some saving factors in this grim situation. One is that many of the world's existing airliner fleets are ageing, and will need to be replaced in the *remaining* years of this decade.

Another is that the imminence of new noise legislation (from 1985-86) will render many existing jets obsolete, requiring their replacement. Boeing of the U.S. estimates that the value of this replacement market on grounds of age and noise alone could be about $58bn by 1995.

It is not surprising that, in view of the current paucity of new orders, every potential contract throughout the world air transport industry is heavily contested by the major manufacturers. Airbus Industrie in Western Europe, with its 250-seat A-300 and smaller 200-plus seat A-310 short-to-medium range jets is fighting Boeing *with its 767 and 757 twin-engined* jet airliners with a ferocity that has surprised not only Boeing but also many others in the world aerospace industry.

Airbus is also seeking to expand its product range, for *example by developing the* projected 150-seater A-320 for which it believes there is a big *market* through to the end of this century, amounting perhaps to more than 1,500 aircraft.

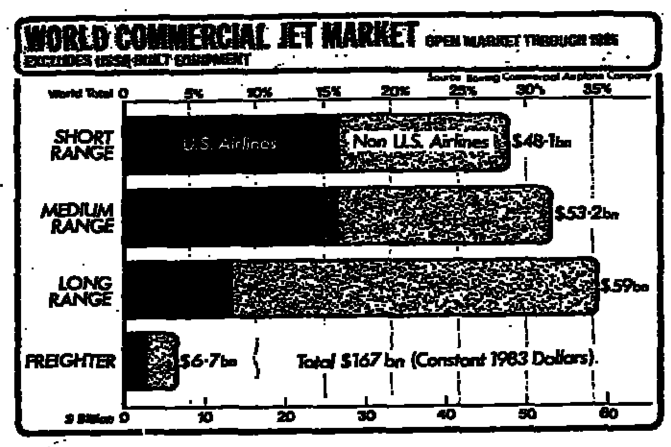
Plans for that aircraft are still being refined in detail, but it is possible that by the time of the Paris Air Show in July, these may have reached the point *where Airbus* may be able formally to announce that the venture is at last firm. At the same time, Airbus Industrie is studying plans for other new aircraft, such as the TA-11 200-seat four-engined long-range (6,000 nautical miles) jet to replace the existing Boeing 707s and DC-8s in world service, where longer range is required *with less capacity* than the current large Boeing 747 Jumbo jets or DC-10 tri-jets provide. Another new venture under study is the TA-9, a twin-engined development of the A-300, with a stretched fuselage to give seating capacity up to 410 passengers according to the configuration desired by airlines.

Beyond that, the TA-12 is a plan for a twin-engined jet for medium- to long-range routes not affected by over-water regu*lations that limit twin-engined* aircraft operations, such as London-Colombo, Frankfurt-Bangkok, the Middle East to Japan and South America to the U.S.

The costs of developing any one of these new versions of the existing Airbus product line will be high, and they are not likely to be attempted until the world's airlines are in a stronger position to buy such refined aircraft. In the meantime, Airbus will be concentrating its development plans on derivatives of the A-300 (the Series 600 model, for example, with its improved fuel consumption and range/payload performance) and the Series 300 version of the A-310, which will be capable of flying longer distances.

With total sales of 350 Airbuses to date (248 A-300s and 102 A-310s) with many more of each type of aircraft on option, Airbus Industrie has already demonstrated that Western Europe can offer formidable competition to the U.S. in commercial airliner markets.

Despite the current paucity of *orders*, Airbus Industrie remains optimistic for the long-term. Its forecasts of the future market for jet airliners, once the recession is ended, indicate a demand for about 6,700 aircraft, worth about $329bn, up to the end of this century. Of this, Airbus expects to win a 34 per cent share, representing about 2,250 aircraft.



These will be primarily in the short-to-medium range market, which Airbus believes will account for some 77 per cent of total demand, or $253bn, with the rest ($76bn) being in the long-haul market. This accounts for Airbus Industrie's current emphasis on the short-to-medium range A-300, A-310 and A-320, although it is not ignoring long-range possibilities as the new longer-range versions of both the A-300 and A-310, and the longer-term TA-11 and TA-12 studies, show.

Backlog

Boeing, the biggest jet airliner manufacturer in the world, with total sales at the end of last year of 4,744 aircraft, has been suffering from the recession like everyone else, but has been weathering it better than most because of the *substantial state of its backlog* of close to $15m, representing several hundred jet airliners of all types.

Although work programmes have been reduced, and the company has been cutting its *labour force (with further lay-offs* occurring this year), Boeing nevertheless appears to be confident that it will ride the remainder of the recession. The company believes that already there are signs of a recovery in the U.S. economy, which it believes will have its effect on the aerospace industry either later this year or early in 1984, and it believes that by the mid-1980s the tempo of airliner ordering, and consequently production, will be rising again.

This *optimism* is reflected in the company's forecasts of future business. Between now and 1995, Boeing is forecasting a total market for jet airliners of all types amounting to $167bn (measured in 1983 constant dollar terms), of which about $116bn will be spent by 1992, the remaining $51bn being spent in the ensuing three years.

This indicates Boeing's belief that in the early to mid-1990s there will be a rising demand for jet transport, as much existing equipment will be phased out and requiring replacement. The overall market for $167bn of new jets is divided in Boeing's forecasts into $109bn for jets to meet traffic growth and $58bn to meet replacement of older jet airliners.

Between 1983 and 1995, *Boeing foresees a total of about* 4,420 new jets being added to the world's fleets. Deliveries in 1983 are estimated to amount to 326 jets from all sources *(European and U.S.), falling in* 1984 and 1985 (reflecting the slacker inflow of new orders in the 1981 and 1982 period as a result of the recession), but rising steadily thereafter.

From 1985, deliveries will continue on a *rising curve*, reaching a high point of 450 jets in 1989, reflecting the fulfilment of the rising volume of orders which is expected in the early- to mid-1980s as the recession fades. Thereafter, the deliveries curve is expected to slacken to about the 300 jets a year level by about 1995.

Boeing's estimates of the market suggest that, of the $167bn of total deliveries, about $48.1bn will be accounted for by short-range jet airliners (mostly *for aircraft* seating up to about 160 passengers a time), with $53.2bn accounted for by medium-range jet airliners (seating between 160 and 250 a time), $59bn for long-range jets (mostly seating 250-plus passengers a time) and about $6.7bn for all-cargo jets.

The markets in terms of numbers of aircraft are analysed as to 800 aircraft in the *long-range* category (Boeing 747s or Douglas DC-10s), 1,150 aircraft in the large medium-range category (Boeing 767s or Airbus A-300s or A-310s), 1,350 aircraft in the short-to-medium-range *bracket (Boeing 757s or prospective* 150-seaters) and about 1,050 aircraft in the short-range category (Boeing 737s or McDonnell *Douglas DC-9s*).

Boeing's product line ranges all the way from the big 747 Jumbo jet, seating up to 400-plus passengers, down to the small 737, which is available in various versions seating between about 115 and 140 passengers. In between lie the 220-plus 767 and the smaller 180-plus seat 757. The long-running, three-engined 727, which has been the world's best-selling jet airliner ever, *with more than* 1,830 sold to over 100 customers worldwide, is now being phased out. The last passenger 727 has just left the production line and the 15 remaining 727 aircraft being built are all-cargo jets.

The new best-selling jet is the small 737, *of* which more than 1,060 have been sold to more than 114 customers. Over 900 of these 737s have been delivered and production is running at a rate of seven air*craft a month. Of the new* Boeing jets, the 767 wide-bodied twin-engined aircraft has sold 176, while the smaller 757-200 has sold 124. The new version of the 737, the 737-300, which is due for roll-out and delivery next year, has sold 28 aircraft.

The big Boeing 747 Jumbo remains in a class by *itself*. Although McDonnell Douglas with its DC-10 series has made some inroads on the long-haul Jumbo jet market *Boeing* remains dominant with over 600 747s ordered in various versions, of which over 570 have now been delivered to 67 companies in 46 countries.

Much of the existing produc*tion is concentrated on the* "stretched upper-deck" version, the 747-300, in which the top deck of this aircraft is stretched by 208 inches to give extended seating capacity, enabling up to about 496 passengers to be carried on the aircraft against about 452 in the standard version. Total orders for the 747-300 total 32 and most of the deliveries this year will *be of* this variant.

Looking to the future, Boeing is studying several new versions of the 747 under the broad designation 747-X. These include a variant with a *stretched fuselage and a new* wing, to seat between 550 and 650 passengers, and another version with the upper deck stretched all the way to the tail to give a true "double-decker" seating between 600 and 800 passengers according to airline choice.

Equipment accounts for a *varying proportion of the final* price of the completed aircraft or engine. It is estimated that one third of the total cost of airliners when delivered to the customer is accounted for by equipment of one sort or another.

Agreement

A recent example of international co-operation between companies in the field of advanced electronic equipment *for commercial airliners is* the announcement last month of an agreement between Marconi Avionics of Rochester, Kent, England and Honeywell of Minneapolis, in the U.S.

Under a sales and distribu*tion agreement* between the two companies, the Honeywell advanced laser inertial navigation system (LINS), used on the latest Boeing airliners, the 757 and 767, is to be incorporated in military systems *offered by Marconi Avionics*.

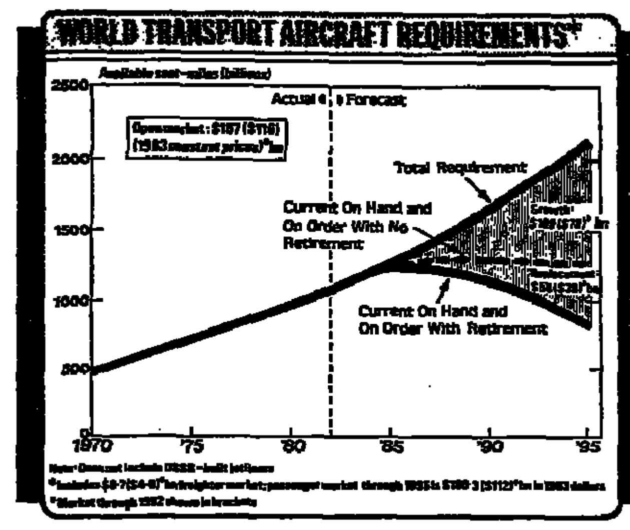
The agreement includes an option for a later manufacturing licence for the LINS equipment to be made by Marconi Avionics in England. The agreement gives the British company exclusive rights to supply military LINS applications in the UK and for applications as *a component of military aircraft* avionic systems for export to countries outside the U.S. and UK.

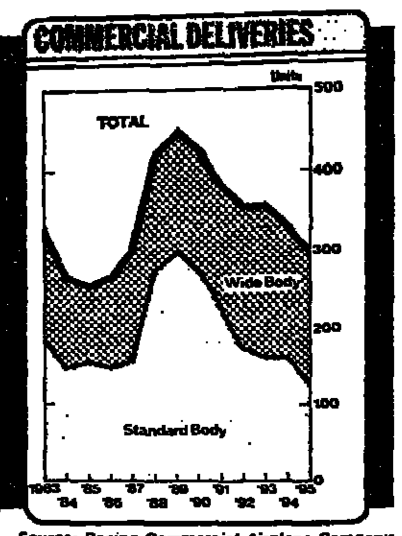
The Honeywell H421 and H423 military systems, covered by the agreement, are being offered for the Anglo-U.S. derivatives of the Harrier vertical take-off aircraft, the AV-8B and the Royal Air Force GR-5, and as a standard inertial navigational system for the U.S. Air Force.

The laser *gyro* from Honeywell, at the heart of the LINS, has made the traditional complex mechanical spinning wheel gyroscopes in older inertial navigation systems obsolete.

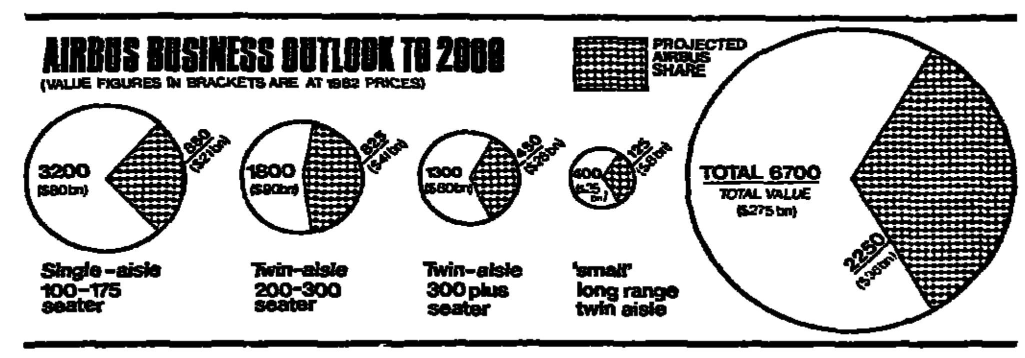
The use of colour cathode *ray tubes* in *becoming standard* practice in airliner cockpits for the display of flight performance information. The Boeing 767 and 757 twin-jet airliners and the Airbus Industrie A310 airliner were designed from the outset to use these displays in place of earlier electro-mechanical dials and gauges.

Michael Donne





Source: Boeing Commercial Airplane Company.



Growing civil use of helicopters

❛ . . . the civil helicopter as a product in its own right still has not fully matured but is likely to do so over the next decade.❜

THE WORLD'S helicopter manufacturers are hoping that the next few years will see a significant upturn in the volume of business, with substantial growth expected in the civil sector, as more and more industries and individual customers become aware of the unique benefits that rotary-winged aircraft can offer.

The capabilities of near-vertical take-off and landing, and of hovering over one place for long periods of time, have already been amply demonstrated in military roles, and in such work as search and rescue. Even vertical or short take-off and landing fixed-wing aircraft cannot vie with this unique capability and an ever-widening range of uses for helicopters seems inevitable.

Forecasts by Sikorsky Aircraft of the U.S., a member of the United Technologies Group, and the world's biggest single helicopter manufacturer, suggest that in the decade 1983 to 1992 the world market for helicopters of all kinds, civil and military, is likely to amount to about 24,000 aircraft, worth about $36bn. This compares with deliveries in the decade 1973- to 1982 of about 19,000 aircraft, worth around $20bn.

This market will be shared mainly between the eight major world helicopter manufacturers —Bell Helicopter Textron, Boeing Vertol, Hughes and Sikorsky, all of the U.S., and Aerospatiale of France, Agusta of Italy, Messerschmitt-Bolkow-Blohm of West Germany and Westland Helicopters of the UK. Supporting these are a number of smaller manufacturers — including Enstrom, Hiller, Kaman and Spitfire in the U.S., and Kawasaki in Japan.

This increase of about 26 per cent overall will have the greatest impact in the civil market, where the share of the total will rise from 53 per cent in the past decade to about 63 per cent. This will reflect a growing demand from individual companies for helicopters for corporate and executive use, as well as a widening range of uses for helicopters in other commercial roles.

According to Mr David S. Lawrence, director of strategic planning for Sikorsky, these trends in turn will stem from the increasing efficiency of the helicopter as a transport vehicle, with greater comfort for passengers, improved styling, higher speed and increased safety—with a widening number of new designs specifically tailored to meet civilian needs, instead of being adapted from original military specifications.

In Sikorsky's view, the civil helicopter as a product in its own right still has not fully matured, but is likely to do so over the next decade. The technology is still evolving — with improved engines and rotor systems, and increasing use of new, lightweight materials, so that tomorrow's helicopters will be significantly better than today's and next year's significantly better than this year's.

The original impetus to commercial helicopter development stemming from military requirements will fade, with the two design paths, civil and military, gradually diverging as specific civil requirements emerge, generating design solutions of their own. However, there will always be a measure of cross-fertilisation between the two, and it seems likely that many new technological developments will still be funded initially through their use in military programmes.

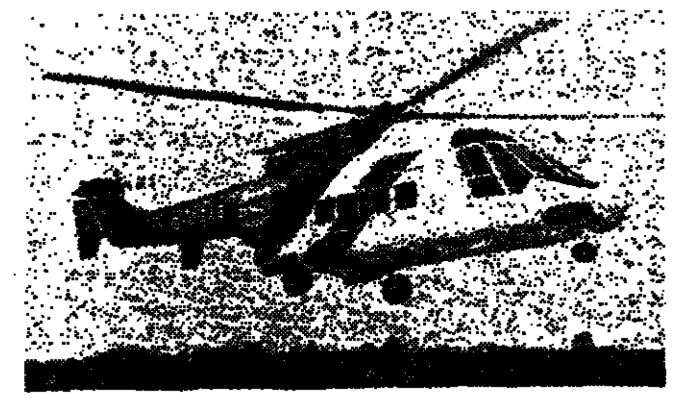
This improvement in civil helicopters is expected to be accompanied by increases in costs and selling prices of between 30 and 50 per cent, but it will also generate a wider variety of uses as commercial exploitation of the helicopter expands. Sikorsky believes that the smaller types of helicopter —that is up to about 6,000 lb gross weight (the lightweight class) and between 6,000 lb and 15,000 lb (the intermediate class) will be those most of interest to the commercial community.

Helicopters of 15,000 lb to 35,000 lb (the medium class) and those of upwards of 35,000 lb (the heavy class) are more likely to be needed either for military duties, or for very specialist civil work (such as logging or lifting other heavy loads), where the market will be limited.

Sikorsky believes that throughout the coming decade, the average annual rate of growth of helicopter manufacture and deliveries will run at about 5.5 per cent. The rates of growth will vary according to classes of helicopter.

In the lightweight class growth should average about 5 per cent, stimulated by growth of interest in the corporate and utility marketplaces, as the past interest in this category expressed by the offshore oil and gas support industries shifts towards the larger, twin-engined aircraft.

In the intermediate class growth should be higher, at about 7 per cent a year, with again the corporate sector showing most interest as industrial production generally improves after the recession and corporate profits rise. This estimate for the intermediate class also takes into consideration an increasing interest in inter-city helicopter activities, and the growth of passenger transport links between urban areas and airports, especially in the U.S.



Restyled and improved to meet the needs of the market, the Westland 30 is already in service with British Airways Helicopters in North Sea operations.

In the medium and heavy classes the predominant interest will be military, with only a comparatively small number of aircraft likely to be ordered for civilian purposes, so that the annual growth rate will be low.

Another significant development is likely to be that most helicopters will be turbine-powered, rather than piston-engine powered, following the development of new turbine engines of greater fuel economy and increased reliability.

Recent developments in this field have included the new version of the Rolls-Royce Gem turbo-shaft engine (for the Italian Agusta A-129 Mongoose helicopter), while General Electric of the U.S. has been awarded a demonstrator engine contract for a new 5,000 hp "modern technology" engine, the GE-27, primarily for the U.S. Army's applied technology laboratory, but with obvious long-term commercial applications.

A further trend that is likely to intensify over the next few years is that of international collaboration in new helicopter development. Last year, Sikorsky itself indicated its desire to share with new international partners the development of new technology in helicopters, and that aim stands.

Sikorsky has generated substantial business over the past years through licensing its designs to other helicopter manufacturers, for example in the UK and Italy and elsewhere.

International collaboration in the world helicopter market is also evidenced by the West German (Messerschmitt-Bolkow-Blohm) programme with Kawasaki of Japan for the twin turbo-shaft engined BK-117 helicopter, while MBB is also working with Aerospatiale of France on plans for a new military anti-tank helicopter, the PAH-2/HAC, intended to become available in the late 1980s.

But by far the largest international helicopter programme now under way is the British (Westland Helicopters) and Italian (Agusta) EH-101, to produce a large multi-role aircraft of over 31,000 lb gross take-off weight, powered by three U.S. General Electric T-700 turbo-shaft engines, and designed for a variety of roles, including a replacement for the current Sea King anti-submarine helicopter.

The plans envisage an eventual commercial version of the EH-101 from the start, however, so that the two versions can evolve side by side. As a civil aircraft, it is envisaged that the EH-101 will carry up to 30 passengers.

The programme is being run by a new joint company, EH Industries, which has been set up by Westland and Agusta. The objective is to fly the prototype in 1984-85, with production aircraft becoming available during 1988-89.

Nevertheless, the venture is being pressed ahead by the UK and Italian Governments and is likely eventually to be the biggest single helicopter development programme in Western Europe, with ultimate production of several hundred aircraft, and involving an investment in development and production of several hundred million pounds.

In the meantime, Westland is pushing ahead with the production of its Westland 30 civil helicopter, developed from the original Lynx multi-role aircraft. Substantially re-styled and improved to meet the needs of the civil market, the 17-seat twin-turbine engined Westland 30 is already in service with British Airways Helicopters in the North Sea, while it is also on order for a variety of other operators in the UK and U.S.

Michael Donne

WORLD HELICOPTER PRODUCTION
(1983-92 forecast)

	Light (0-6,000 lb gross weight)	Intermediate (6-15,000 lb gross weight)	Medium/Heavy (over 15,000 lb gross weight)	Total
Military	2,400	2,700	4,000	9,100
Civil	12,100	2,300	500	14,900
Total	14,500	5,000	4,500	24,000

Source: Sikorsky Aircraft (U.S.).

Michael Donne outlines the steps the airlines must take to overcome their financial problems

Brake on investment

❛ The airline industry argues that fare levels still lag perhaps as much as $1bn behind the rises in fares needed to offset past rises in fuel costs alone. ❜

THE MOST DIFFICULT challenge facing the airlines is likely to be finding the money with which to buy the new equipment that everyone agrees will be needed in the air transport industry through to the end of this century.

The heavy losses incurred by many airlines as a result of the recession, coupled with the very high cost of borrowed money, has resulted in an effective, although unwritten, "buying moratorium" by the airlines on new equipment, with the result that the aerospace manufacturers themselves have been obliged to slow down production rates substantially, and even in some companies to lay off labour in large numbers.

Figures compiled by the International Air Transport Association show that the current heavy burden of interest payments is the most serious problem confronting many airlines. In 1982, for example, the collective result for the IATA member-airlines was an operating loss of only $260m worldwide. But by the time interest payments of $1.61bn were taken into account, the overall loss rose to $1.87bn.

For the current year, the operating loss will be rather higher, estimated at about $370m. But the burden of interest will rise to $1.73bn, bringing the total industry deficit to about $2.1bn.

By 1984, as a result of the various retrenchment measures introduced by many airlines, the operating result is forecast to be a profit of about $440m worldwide, the first for five years, but the industry will still have a deficit of $1.4bn as a result of an even higher interest burden of $1.84bn.

It is difficult for the airlines to know how to cope with this situation. There is no reason why they should be regarded as a "special case" industry, seeking relief from high interest rates. But there is every reason for them to argue that if the current high interest rates continue to prevail, the re-equipment tide that many manufacturers hope will start in the mid-1980s could be blocked in mid-flow, or at best slowed down, no matter how rapidly traffic may recover.

Answer

The financial community's answer to this is simply that the airline industry must do much more to put its own house in order—in short, work harder to earn profits.

It is now probably fair to say that, as a result of the traumatic experiences of the past two to three years, many airline managements have become much tougher and more efficient than they were in the fatter days of the 1970s, and that they and their airlines are therefore better geared to take advantage of the recovery when it comes.

The financiers themselves make no secret of their belief that the airline industry still has some way to go before it can be regarded as the prime customer for cash that it once was. The banking community as a whole has been badly shaken by the heavy losses incurred by the airlines, especially in the U.S., in recent years, and by the demise of Laker and Braniff, not to mention a number of lesser-known operators in the U.S.

Some bankers are still fearful that before the recession ends, there may well be one or more further collapses of equal magnitude.

This is especially so in the U.S., where the unbridled "fares wars" that have been a consequence of deregulation, coupled with shortage of traffic, have brought many airlines to the brink of bankruptcy.

Outside the U.S., the spectacle of what has been happening has frightened many governments and aviation agencies away from any ideas they might have had of encouraging deregulation, and confirmed them in their belief that an evolutionary, rather than revolutionary approach to change is the best possible way forward.

Tight control

Those airlines which have been able to keep their finances under tight control and earn profits, albeit small ones, or which are supported by their governments (and the latter situation is the one most commonly prevailing throughout the rest of the world outside the U.S.), do not find it difficult to raise cash for new aircraft. The fact is that where banks and other lenders can be reasonably assured of an airline's long-term ability to pay, finance can be arranged, as is evidenced by some recent major deals for airlines in the U.S. and elsewhere.

The significant feature of most of these arrangements, however, is that they involve consortia of lenders. While individual financial institutions are sometimes prepared to be a sole source of finance for an airliner deal where the sum involved is comparatively small, the very large deals involving many millions (even hundreds of millions) of dollars invariably involve groups of lenders, with one or more "lead managers" who put the intricate arrangements together.

In this way, not only is the risk widely spread throughout the financial community, but also the share of the profits accruing over the deals is widely spread also. Contrary to general belief, the aerospace industry is currently one of the banks' biggest single customers, with a current outstanding liability of well over $20bn worldwide for aircraft either on order or recently delivered and still being paid for.

This figure seems likely to rise substantially in the remaining years of this decade, as the prospective outlay by the airlines on new aircraft expands, as they replace existing ageing fleets or move to meet new noise legislation, and to cope with prospective traffic growth.

Another element that has emerged in the provision of airline financing is a growing share taken by the manufacturers themselves. In many instances, airlines have been able to acquire new aircraft only because the manufacturers themselves have either lent them the money (thereby effectively subsidising the sale of their own products), or have been able to offer finance through prior arrangements of their own with lending institutions.

The concept of long-term leasing has also been developed to enable airlines to acquire new equipment. This is becoming increasingly popular, since in effect it requires little initial financial investment by the airlines themselves, although over the long term it can generate a steady income to the lenders through the leasing fees available.

The airlines are often able to generate the cash to pay the fees through the savings they can achieve by using the new, more competitive and fuel-efficient aircraft. For an airline, this method provides an immediate and positive cash flow, as opposed to negative cash flow often involved in the outright purchase of the aircraft.

The manufacturers have been obliged to become so deeply enmeshed in providing the financial backing for airline re-equipment plans because, in the current environment, there is often no other way of selling their wares.

It is a fact that across the spectrum of aircraft types, the competition generally devolves upon two types of aircraft for each range/payload requirement—the Airbus A-300/A-310 versus the Boeing 767/757 medium-range jets, for example, or the McDonnell Douglas long-range DC-10-30 versus the Boeing 747, or the McDonnell Douglas DC-9 Super 80 versus the Boeing 737 in the short-range class.

Frequently, an airline finds that it could comfortably and profitably use either one of the aircraft involved in the category in which it is interested, in which case the entire negotiation becomes a matter of which manufacturer can offer the best financial terms. The marginal differences in performance between the different aircraft on the airline's routes can often be outweighed by the financial benefits accruing over several years from one manufacturer's (and associated lenders') financial package.

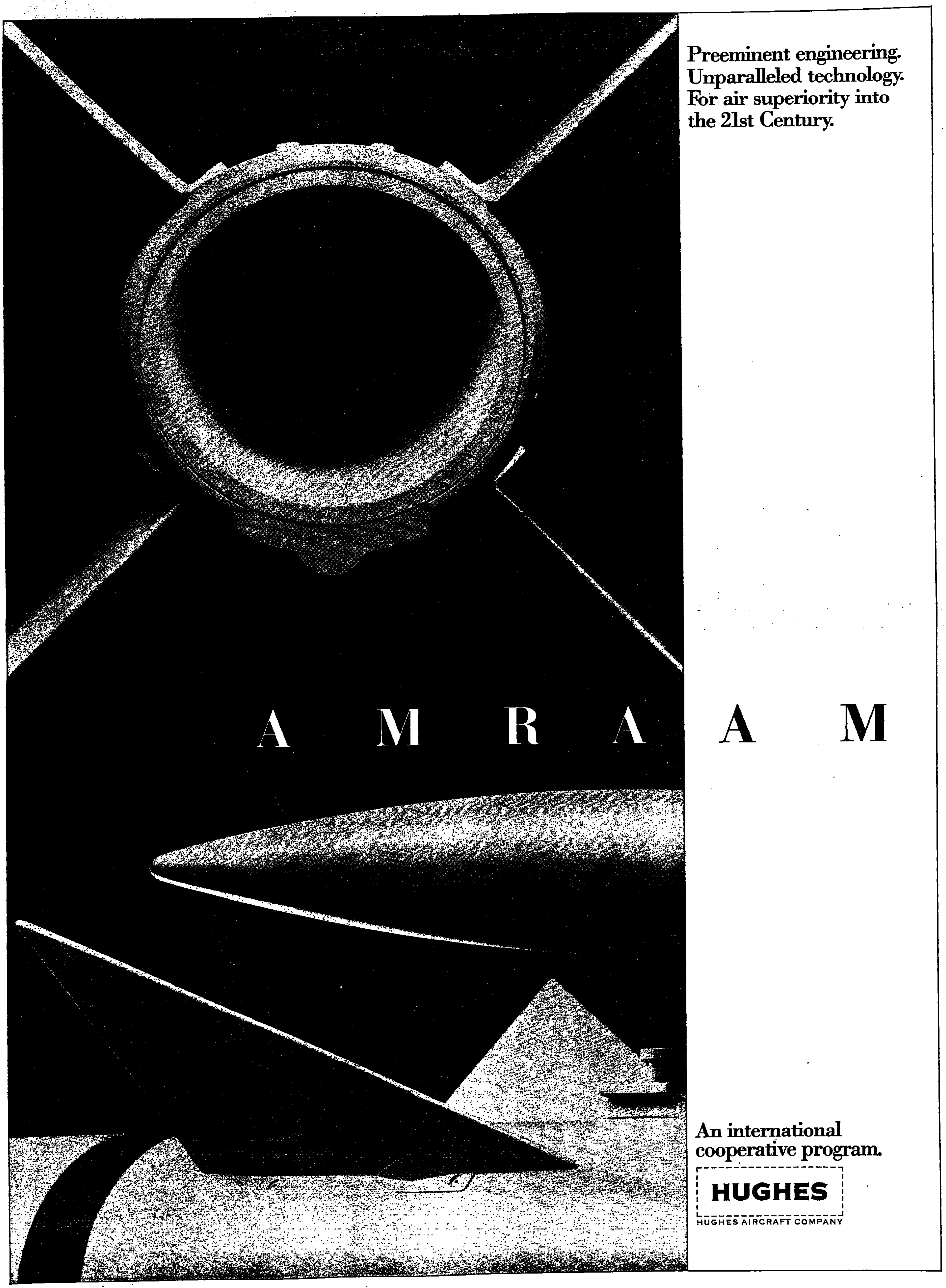
Package

Thus, many of the sales battles that are already taking place world-wide are not so much between rival types of aircraft as between the rival financing packages associated with a particular manufacturer.

A classic example of this situation is that now involving British Airways, which needs a new fleet of up to 20 short-range jets by the end of 1985 to replace ageing and by then unacceptably noisy Trident Three and One-Eleven jets. Although a confirmed, long-standing Boeing 737 operator, with 28 of those aircraft in its fleet, BA has made it clear that it is looking at both the Boeing 737-200 and 300 models, and the McDonnell Douglas DC-9 Super 80.

Whichever manufacturer can put together the best financial package seems likely to win the deal, since BA could comfortably operate either makers' aircraft on its routes.

All this is less simple than it sounds. In fact, the final decision emerges only after many months of patient negotiation involving the airline, the manufacturer and the consortia of banks involved, in which virtually every minute detail of the airline, its operations and its prospects is carefully weighed by the potential lenders, while the aircraft makers seek to improve their own products to help influence the final decision.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Unparalleled technology.
For air superiority into
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Business aircraft hit by cuts in world demand

‘... the decline in demand for these aircraft ... was on a scale rarely experienced in the short history of the general aviation industry.’

THE MARKET FOR business and general aviation aircraft in the U.S., the sector's biggest market, slumped dramatically last year in the face of high interest rates and a continued tightening of companies' budgets.

The industry in the U.S. acknowledges that trading conditions were difficult last year, but the manufacturers remain confident and optimistic about prospects especially in the light of moves towards lower interest rates.

Nevertheless, the decline in demand for these aircraft, from advanced business jets to simple single-engine aircraft for pleasure use, was on a scale rarely experienced in the short history of the general aviation industry.

Resilience

The deliveries of new business and general aviation aircraft fell over the year by over half to 4,266 aircraft, compared with 9,457 delivered in 1981. The sales value of these aircraft, at a total of $1.99bn, fell less sharply, by 31.5 per cent, from the record sales of almost $3bn in 1981, indicating some resilience in the demand for the higher price, but lower volume business jet and turboprop aircraft.

Industry forecasts for this year indicate delivery of 4,415 aircraft, from U.S. manufacturers, with a value of $2bn, a slight improvement over last year.

This was acknowledged in a speech earlier this year by Mr Edward W. Stimpson, president of the General Aviation Manufacturers Association. "All segments of the market place were affected last year, but more complex and sophisticated aircraft were hit less," he told members of the U.S. Aerospace Analysts Society.

Figures from the association underline the importance of jet and turboprop aircraft to the sector as a whole. In 1982, the U.S. business and general aviation industry delivered a total of 259 jet aircraft out of the total deliveries of 4,266 aircraft for the year. Yet these jets, mainly for business use, represented almost half the total sales value of all the general aviation aircraft sold last year.

The association has forecast that there will be a further decline in volume terms for sales of these jet aircraft this year, with an estimated 175 likely to be sold, valued at $800m.

Demand for all types of business and general aviation aircraft is related closely to the performance of Gross National Product, and especially to spending on new plant and equipment, with many business aircraft purchased as a capital expenditure item.

The General Aviation Manufacturers Association reports that sales of its categories of aircraft have paralleled new plant and equipment expenditure in the U.S. The association forecasts that increases in corporate spending in the U.S. later this year "should directly benefit business aviation sales."

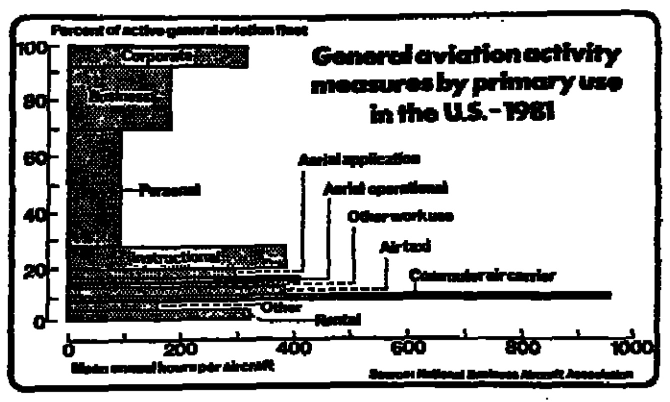
Lower interest rates would also clearly help the industry, although it had been more resilient than other industries until interest rates reached 12 per cent. The first sector of the business and general aviation market to suffer was the market for single and multi-piston engine aircraft.

The impact of high interest rates on turboprop aircraft sales was marked in 1982, with deliveries down to 458 aircraft, about half the total number delivered the previous year.

The industry has forecast that up to 450 turboprops — with a market value of $700m — are expected to be sold this year by U.S. manufacturers.

In the market for piston engine aircraft, where volumes are greater than in the jet and turbo-prop sectors but where unit prices are lower, the U.S. industry delivered 2,870 single-engine aircraft and 680 twin-engine aircraft, a total in this category of 3,550 aircraft.

In comparison, the association has forecast a slight improvement in piston aircraft sales, with an estimated total of 3,790 aircraft expected to be delivered this year, 3,065 single-engine aircraft and 725 twin-engine aircraft, with a total value of $500m.



U.S. MANUFACTURERS' NET REVENUE FOR BUSINESS AND GENERAL AVIATION AIRCRAFT (Jan.-Dec. 1982)

	($m)
Ayres Corporation	4.9
Beech Aircraft	320.2
Cessna Aircraft	531.8
Fairchild Aircraft	87.6
Gates Learjet	423.0
Gulfstream American	446.4
Lake Aircraft	2.6
Maule Aircraft	1.9
Mooney Aircraft	N.A.
Piper Aircraft	179.0
Schweizer Aircraft	3.3
Total	1,99.5

Source: General Aviation Manufacturers' Association (U.S.).

The industry in the U.S. is dominated by a few large companies and several smaller, more specialised manufacturers.

Cessna Aircraft dominated the industry last year with total sales of 2,140 business and general aviation aircraft worth $531.8m. In value terms, Gulfstream American came second with total sales of $446.4m from the delivery of 96 aircraft, reflecting the higher value of the company's range of aircraft.

In terms of sales volume, Piper Aircraft, specialising in producing an extensive range of smaller business and general aviation aircraft, came second with 1,048 aircraft sold last year, worth $179m.

The U.S. business and general aviation industry also exports a substantial proportion of its output, although it by no means has the market to itself. Last year, the U.S. manufacturers exported 27 per cent of its aircraft production, a third of its total sales by value. Exports this year are forecast to account for a quarter of sales in volume terms and 28 per cent by value.

In Europe, British Aerospace has a limited but successful range of business and general aviation aircraft. Its highly successful HS 125 executive jet is one of the best-selling aircraft in the company's range, with total sales to date of 553 aircraft. Of these, 80 per cent, valued at £600m, have been sold in export markets. About 60 per cent of the exports have been to North America.

At the smaller end of the scale, BAE has its Jetstream 31 commuter aircraft, with ten firm orders for the aircraft, including one, so far unnamed, customer in the U.S. The aircraft is to be presented by British Aerospace at the Paris Air Show in a new luxury executive version with between eight and nine seats compared with the more usual 18 to 19 seats in the aircraft's commuter airliner role.

Other manufacturers of business and general aviation aircraft in Europe include Aerospatiale in France, Dornier in W. Germany, Fokker in Holland and Rinaldo Piaggio and Aeritalia in Italy.

In Britain, business and general aviation operations are less well developed than in the U.S., although a total of over 6,700 aircraft in the category are registered in Britain, with about two-thirds used for private and business purposes. These aircraft use the 200 or so airfields in Britain and the 2,000 airfields in Continental Europe for day-to-day operations as well as the major airports.

These airfields give the operator of business aircraft one of the sector's great advantages over conventional, scheduled flights. Few population centres in Britain or on the Continent are far from a suitable airfield, and access is rapid and easy.

Lynton McLain

Growing number of leisure flyers

LEISURE FLYING, in all its forms, is becoming a substantial growth industry for manufacturers of light aircraft, gliders, hang-gliders, balloons and the new and often unconventional shapes of microlight aircraft.

It is estimated that as many as 50,000 people in Britain alone fly one or other of these machines for pleasure each year.

Flying fixed wing, powered aircraft is the most popular single category of leisure flying, with an estimated 20,000 or more qualified pilots holding private licences in Britain. Training for a licence to fly powered aircraft is expensive and can be time-consuming. Total costs will vary with the skill of the student pilot, but well over £1,000 is normal.

One approved scheme involves the student training with a minimum of 35 hours flying training at an approved flying school, all to be completed within six months. A more leisurely route is the CAA (Civil Aviation Authority) authorised 40-hour flying course. This has the advantage for some students that it can be completed over any period of time.

Gliding is the second most popular form of leisure flying in Britain, with an estimated 11,000 active glider pilots in the country. These pilots fly from any one of the 100 or so clubs around Britain, most of them strategically placed to take advantage of geographical features such as long hill ridges which encourage the warm air thermals that glider pilots need for soaring.

Many of Britain's top glider pilots are expected to take part in the UK National Gliding Championship, to be held at Lasham Airfield, Hants, from July 23 to 31.

The event, sponsored by Marconi Avionics, probably will be the largest gathering of gliders at one site for 15 years, with 80 top pilots contesting the Open Class National championships.

Carbon fibre and glass fibre are being used increasingly in the construction of advanced gliders, and it is the use of these light and strong materials, combined with advanced aerodynamic designs, which gives some of the top gliders lift to drag ratios—the crucial performance feature of gliders—as high as 50:1.

The growing number of microlight aircraft provide the third category of aircraft for leisure flying. In the U.S. the Federal Aviation Administration has estimated that there are 35,000 of these low-cost "ultralight" aircraft flying, with steady growth predicted.

The Falcon single-seat, tail-first design from the U.S. Aerolite company won the top award at a recent convention for experimental and ultralight aircraft held in Florida. The aircraft, with its diminutive 28 hp engine and speed of up to 60 miles an hour, typifies the type of craft on the market for less than the price of a family saloon car—in this case, $6,000 in kit form.

L. McL.

Signs of cargo demand reviving

‘Airlines and airport authorities are cautiously optimistic that the decline in demand for air cargo services has ended.’

THE SUSTAINED slump in demand for air cargo services throughout the world over the past two years is showing tentative signs of easing as conditions for world trade in general improve in the light of lower interest rates.

At the same time, the vigorous cutting of freight rates prevalent from the start of last year has been replaced by a more stable regime of rates which are more comfortably above the cost of operating air cargo services.

Last year, some of these rates, especially over the once lucrative North Atlantic air routes, fell substantially below the minimum level necessary to provide the services.

Airlines operating on the North Atlantic routes estimate that it costs 21p to fly a kilogramme of freight from, say London to New York. At the height of the rate-cutting war last year rates fell as low as 12p a kilogramme—"hopelessly uneconomic" according to some operators.

By the end of last year, a tacit agreement among the airlines resulted in air freight rates rising to the more stable levels of between 30 and 40p a kilogramme.

The industrial and commercial customers of the air cargo services, in general, have not rebelled against these rates, giving substance to thoughts that the worst of the recession so far as air cargo is concerned may well have passed.

Airlines and airport authorities are cautiously optimistic that the decline in demand for air cargo services has ended. The cargo sector did not grow at all between 1979 and 1980, when 11m tonnes of freight were carried by world airlines according to the International Civil Aviation Organisation.

Between 1980 and 1981, the volume of air cargo declined substantialy, by 2 per cent to 10.8m tonnes, although the activity in the air cargo sector, measured more comprehensively by tonne-kilometres, reflecting the tonnage and the distance carried, increased by 5 per cent to 30,160 tonne-kilometres.

This increase at a time of declining tonnage volume, indicates that the long-distance air cargo sector perhaps stood up more resiliently to the pressures of the recession than the short-haul business.

Between 1981 and 1982, very modest growth returned to the air cargo sector worldwide, with the ICAO reporting a growth of 1 per cent in the tonnage of freight airlifted, to 10.9m tonnes, according to preliminary estimates.

In Britain, the airlines operating air cargo services suffered more than airline worldwide, with the seven airports of the British Airports Authority reporting a total of 599,000 tonnes of air cargo lifted in exports and imports last year, a decline of 4.7 per cent on the previous year.

Suffered

Some of the BAA's airports suffered particularly badly, with Prestwick in Scotland, showing a 34 per cent decline to 11,700 tonnes. Glasgow showed a 4 per cent increase, at 12,400 tonnes.

In the south east of England, the country's major airports, at Heathrow and Gatwick, and the smaller Stansted, reported that a total of 566,000 tonnes of air cargo was handled last year, a decline of 4 per cent on 1981.

Of the world markets served by air cargo carriers operating out of airports run by the British Airports Authority, those to Africa showed the greatest decline last year, with a fall of just over 15 per cent to 67,800 tonnes. Traffic to and from continental Europe rose by 3 per cent to 167,000 tonnes, and air cargo traffic on UK domestic routes fell by 6.6 per cent to 28,100 tonnes.

Nevertheless, despite the mixed fortunes of the UK air cargo industry last year, there are signs that the higher rates on the North Atlantic are likely to remain in force this year. British Airways quotes a rate of 46 pence a kilogramme for 500 kilogramme cargo loads on the London to New York route, higher than the rates charged last autumn and winter and indicative of the stronger demand for air freight services.

The airlines in general have cut back their air cargo capacity, with the specialised all-cargo aircraft operated by fewer of the scheduled carriers than in the past. These airlines have made strenuous efforts to consolidate more of their air cargoes into the holds of their remaining passenger aircraft, in an attempt to maximise the use made of resources.

This development has not prevented specialised all-cargo airlines from operating regular services with their specialised fleets. Flying Tigers, the U.S. airline, remains the world's largest all-cargo carrier and is the world's largest operator of Boeing 747 and DC8 aircraft.

Lynton McLain

More ventures needed to fill factories

The UK

THE UK aerospace industry has been for some time a major exporter, generating a surplus on balance of payments account despite the heavy imports of foreign-built aircraft, especially commercial airliners.

During 1982, the UK industry as a whole exported over £3.11bn of its products, or more than 20 per cent greater than in 1981. Of this total, exports of aircraft and parts accounted for over £1.6bn while exports of engines and parts accounted for over £1.17bn.

All sections of this industry did well, however, with guided weapons exports amounting to more than £61m, instruments for over £152m and radio communications aids for close to £25m.

Against this, however, there were imports amounting to over £1.98bn, so that the overall surplus on the balance of payments account was £1.12bn.

New ventures

A significant feature of the export statistics, however, is the high volume of parts and spares involved—over £1.15bn for aircraft parts and over £492m for engine parts. This reflects the influence of international collaborative programmes in which UK companies manufacture parts for joint ventures (wings for the European Airbus, for example), while it also reflects the way in which aircraft and engine ventures begun some time earlier can continue to yield high incomes for many years.

But the export statistics also indicate that the industry needs new ventures, both military and civil, with which to fill its factories through the rest of this decade and through the 1990s. The number of "new aircraft" exported last year amounted to only £346m, or little more than 10 per cent of total exports, while "new engines" accounted for a rather higher proportion, at nearly £486m. It is hoped that as current new ventures—such as the British Aerospace 146 four-engined jet regional airliner—build up sales, this situation will improve.

British Aerospace remains the linch-pin around which the UK aerospace industry is concentrated, developing a wide range of civil aircraft, from the BAe 146 four-engined regional airliner, through to the Jetstream 31 and BAe 748 twin-engined turbo-prop airliners and the small BAe 125 twin-jet executive aircraft.

In addition, BAe has a 20 per cent stake in the European Airbus Industrie airliner manufacturing consortium for whose A-300 and A-310 twin-engined jet airliners BAe builds the wings, with plans also now being finalised for a probable participation by the UK group in wing production for the projected new A-320 150-seater version of the Airbus.

At the same time, BAe's involvement in military aviation remains strong, with production of the Anglo-West German-Italian Tornado multi-role combat aircraft (of which eventually 809 are to be built) now running at a high level, alongside continued production of Jaguar jet strike-trainers for international markets.

Work on the UK share of the production of the AV-8B Harrier II, for both the U.S. Marine Corps and the RAF, is also now a major aspect of BAe's military activity, at its Kingston-Brough Division, as is production of the Hawk jet trainer and light tactical combat aircraft for both the RAF and overseas markets. A version of the Hawk has been selected by the U.S. Navy for its undergraduate jet flight training programme, the VTXTS.

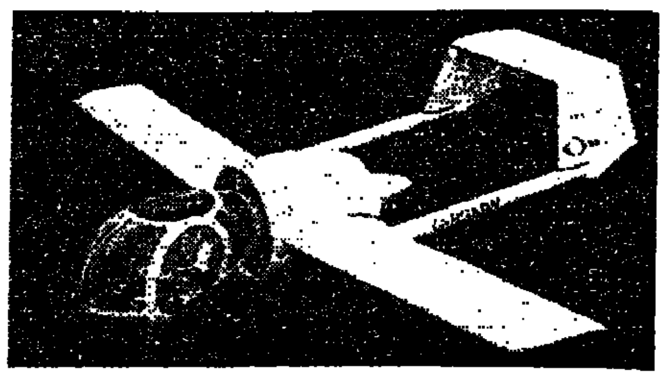
In Space, too, BAe is developing an expanding business, through its Dynamics Group, especially in the development and production of satellites for communications and other duties, for the European Space Agency and other customers.

One of the most significant aspects of BAe's space work is the building of the Unisat communications satellite capable of about £120m, which will be Britain's first commercial communications satellite, worth direct broadcasting transmissions from space into private homes.

The increasing volume of BAe's military missile business is discussed elsewhere in this survey.

The effect of all these activities during 1982 was to generate a 24 per cent increase in worldwide sales by BAe, with a profit before tax of £84.7m, 20 per cent up on 1981. Sales reached over £2bn, compared with over £1.66bn in 1981, and at the end of the year the order backlog amounted to over £4.22bn compared with £3.89bn at the end of 1981.

The group chairman, Sir Austin Pearce, in his review of 1982, made it clear that while space, missiles and military aircraft activities all did well, the weakest sector was civil aircraft, where demand was low as a result of the recession and competition worldwide was fierce. In view of the likely continuation of low demand for new airliners, as a result of the airlines' lack of enthusiasm for new jets, BAe has made a special provision of £100m in its 1982 accounts, to cover the continued cost of development and production of the 146 and other civil aircraft pending a revival of sales in an improved economic situation, and the need to cover BAe's own contributions to financing airline orders for Airbuses and other aircraft.



The Edgley Optica, made by Edgley Aircraft, is now steadily winning acceptance at home and overseas

To signify its confidence in the long-term future of civil aviation, BAe is not only preparing to participate in the development of a future European Airbus A-320 150-seater airliner, but is also planning the development of a new, advanced twin-engined turbo-prop powered airliner of its own, the Advanced Turbo-Prop (ATP), seating up to 64 passengers, which will complement the existing BAe 748 in world markets.

After British Aerospace, Short Brothers of Belfast is the largest fixed-wing aircraft manufacturer in the UK, with emphasis upon commuter airliners such as the twin-engined 30-seat SD-330 and the larger 36-seat SD-360.

Both of these aircraft are wide-bodied, and have sold well overseas as well as in the UK, especially in the U.S., where they have been much in demand from the commuter airlines. To date, more than 112 SD-330s have been sold, of which over 90 have been delivered, while orders and options for the 360 stand at over 46 aircraft, of which over ten have been delivered.

The smaller Skyvan, a short take-off and landing aircraft, which has been in production for several years, with over 150 sold, continues to sell well overseas, where it is employed in a wide range of civil and military roles.

Short Brothers, however, is more than just an aircraft builder. It has built up a substantial reputation in the "aerostructures" business—the supply of parts for other manufacturers' aircraft.

One element of this is engine nacelles for large-thrust engines, in which Shorts claims to be the leading specialist in Western Europe. The company builds nacelle components for Rolls-Royce RB-211 engines installed on Boeing 747 Jumbo jets and Boeing 757s, while it also builds complete engine nacelles for the U.S. Avco-Lycoming engines jet used on the new BAe 146 airliner.

Other major aspects of the Short Brothers aerostructures business include the risk-sharing partnership with Fokker of Holland covering wing design and production for the F-28 Fellowship airliner, and the manufacture of wing components for the Boeing 757, and landing gear doors for the Boeing 747.

Shorts is also substantially involved in the guided weapons industry, especially with its Blowpipe portable close-range guided missile, Seacat close-range ship-borne anti-aircraft missile and its Tigercat land-based variant.

In addition to its main aircraft, aerostructures and missile businesses, Shorts is involved in a number of allied projects, prominent among which are its flying services activities, which include the provision of maintenance and operational services for military and civil organisations.

In the smaller aircraft category, Pilatus Britten-Norman is active in the Isle of Wight, building the twin-engined Islander light transport, with various versions on offer—including the new turbine-Islander, and the Defender for military roles. Total deliveries by Pilatus Britten-Norman now stand at over 1,000 aircraft, with a substantial backlog on hand.

Also of significance for the UK industry's long-term future are the efforts of several manufacturers who are seeking to promote the expansion of small, light aircraft manufacture. One is Edgley Aircraft, which is building the small, three-seat observation aircraft, called the Optica.

This aircraft, which in design looks like a bulbous-eyed insect, can loiter at 57 mph, with a stalling speed as low as 46 mph. It is idea for any form of aerial work requiring slow, stable flying, and it has a range of 600 nautical miles.

Start up delayed

An initial production run of 200 aircraft is planned, with firm orders in hand for 26 aircraft, and many more in negotiation at home and overseas.

Another new company is Fan Holdings, a U.S.-based company in Reno, in which the UK Government has a 5 per cent shareholding. The UK Government has pumped substantial cash into the company (over £7m in grants, over £18m in loans and further substantial bank guarantees), to help the production in Northern Ireland of a turbo-prop aircraft called the Lear Fan, an executive machine making extensive use of carbon fibre in its construction.

Production start-up has been delayed, pending certification of the aircraft in the U.S. by the Federal Aviation Administration, but it is still hoped to get the project under way by late summer.

There are in addition several smaller companies active in the fixed-wing light aircraft manufacturing field. Aircraft Designs (Bembridge), of the Isle of Wight, is working on the Sheriff two to four lightweight training and utility aircraft, while NDN Aircraft, also of the Isle of Wight, is building the Firecracker two-seat training aircraft, with a turbo-prop version under way also, and an agricultural aircraft called the NDN-6 Fieldmaster.

Slingsby Aviation, of Kirkbymoorside, Yorkshire, is building under licence the French Fournier two-seat light aircraft, designated the T-67, which is intended to be available in several versions.

Michael Donne

Balloon record bid

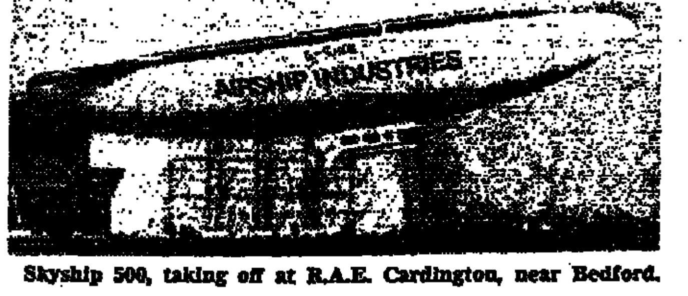
AN ATTEMPT to set a new world altitude record for hot air balloons is to be made in the UK this summer by Mr Mike Kendrick, managing director of Lighter Than Air, a hot air balloon and airship operator, and Mr Per Lindstrand, who heads his own balloon and airship manufacturing company, Colt Balloons.

The hot air balloon altitude record is 55,134 feet, but the two men aim to go much higher. The balloon and pilots' capsule have been specially designed by Mr Lindstrand, and in theory an altitude of about 100,000 feet is achievable. The venture, called Operation Sky Quest, is sponsored by the National Dairy Council and many other British companies.

The balloon itself will be bullet-shaped, about 200 feet high and made of over 6,000 yards of Kevlar fabric. It will contain more than 400,000 cubic feet of air. To achieve the necessary lift, the air must be as hot as possible, within the limitations of the envelope fabric. To reach these high temperatures, the burner system will be the most powerful yet, including a secret new design development to enable it to burn at heights where the rarified air would not normally support combustion.

The crew's pressurised capsule will contain an on-board computer to co-ordinate information on weather conditions and to help in navigation and in communications with the ground. The launch probably will be in July.

M.D.



Skyship 500, taking off at R.A.E. Cardington, near Bedford.

Airships boost in the UK

A BIG EFFORT to reawaken both public and commercial interest in the long-term potential of the airship is being made in the UK by the private-venture company, Airship Industries.

This company is involved in the design, manufacture and flight operation of a new generation of non-rigid airships which incorporate modern, lightweight, high-strength materials and many new design features.

The craft now being developed by Airship Industries uses non-combustible helium gas as the lifting agent — eliminating the dangers associated with the earlier airships which used the highly flammable hydrogen—and has "vectoring propellors" to provide vertical take off and landing.

The first craft built by the company is the Skyship 500, which first flew in September 1981, and which has been performing successfully since in the UK and on the Continent, including last year's Farnborough Air Show.

A second Skyship 500 has been assembled in Canada where it flew a few weeks ago. It is to undertake trials this summer for the U.S. Navy—which has been an extensive user of non-rigid airships ("blimps") for escort and patrol work.

The Skyship 500 seats up to 12 passengers, and has a maximum speed of about 60 knots, with a disposable load of about 2 tons. A larger craft, the Skyship 600, seating up to 20 passengers, is now under development.

For the longer-term, the company is planning even larger craft, such as the Skyship 2000 seating up to 80 passengers and the Skyship 5000 seating nearly 200. However, these two latter ventures are still a long way ahead.

AI claims that there are many advantages for the modern airship compared with its fixed-wing and rotary-winged counterparts.

The primary benefits are that it is cheaper to operate, and does not require the vast expanses of modern airports in which to load and unload. Moreover, it is very quiet, causing none of the noise and pollution problems so often associated with other types of aircraft.

Another advantage is that it is comparatively slow-flying, so that it is potentially useful for a wide range of tasks that fixed-wing aircraft cannot perform because of their inabilities to fly slowly, or which rotary-winged aircraft cannot perform because of their comparatively high costs.

The airship, for example, is exceptionally valuable as a surveillance vehicle for military and civilian duties (the latter include police traffic surveillance, tourist sightseeing, TV and radio platform, advertising, inspection of pipelines and other installations, fire-watching in forests and other areas, and search and rescue activities).

Airship Industries believes strongly, therefore, that there is a place for the airship in the current world aerospace scene. Its main task is to demonstrate this by not only continuing to fly the Skyship 500, and also the larger Skyship 600 later this summer, but also by winning orders from interested customers, and building up a strong background of safe, reliable and profitable operational experience.

M. D.

Military orders acting as a prop

The U.S.

THE U.S. AEROSPACE industry is not exactly booming. But perhaps remarkably given the state of the airline industry, the profit figures coming out of the aerospace sector are not that bad either.

Last year the U.S. industry recorded sales of about $63.3bn, down 6.7 per cent and the first decline in a decade. But the industry has adapted to the new climate.

Military orders undoubtedly have propped up the industry, staving off disaster for some companies and enabling others to post reasonably healthy full-year and first-quarter earnings figures, but other changes have been under way.

Costs, and in some cases workforces, have been cut, capital spending has been delayed or cancelled, debt ratios have been brought down, businesses have been diversified and, perhaps, most crucially — new financing methods to sell aircraft have been devised.

Lockheed bit the bullet in late 1981 and decided to halt production of the L1011, taking a $28.70 a share write-off in the process. For McDonnell and Boeing, riding out the recession has proved only slightly more palatable.

The manufacturers serving the commercial airline market have had some of the toughest decisions to make over the last 18 months. The well-publicised airline failures like those of Braniff and Laker are symptomatic of the crisis which the airlines have been facing. With airlines such as Delta, Pan American, TWA, United and Eastern all reporting huge full year and first quarter losses, they have not been exactly bending over backwards to buy new aircraft.

Both Boeing and McDonnell Douglas remain committed to the commercial market, but they have paid the price in falling sales and operating losses on their commercial aircraft business.

Last year Boeing announced new orders for 110 jet transports worth $3bn compared with orders the year before for 224 jets worth $6.1bn. And McDonnell Douglas, in spite of boasting the biggest seller of the year, the Super 80 with 48 per cent of a very depressed worldwide market, fared little better.

Commercial aircraft sales fell by almost a half from the previous year and the company recorded a $45.8m loss on its commercial aircraft division. First-quarter sales at McDonnell were higher in all divisions except commercial aircraft, where sales fell by 15 per cent.

To cope with falling demand both McDonnell Douglas and Boeing have been forced to adopt a more flexible attitude to selling their jetliners.

Both McDonnell Douglas and Boeing have entered into deals recently involving them in buying back old aircraft from customers in order to win new orders. Boeing, under an eight-year leasing deal covering the sale of 33 737-200s to Delta, is buying back 11 L-10-11s and seven 727-200s.

McDonnell Douglas, which earlier this year wrapped up the biggest commercial aircraft deal ever with Alitalia, is buying back used jets from the Italian airline which has agreed to buy 30 Super 80 jets for $1bn.

McDonnell has also spearheaded the most innovative financing packages in the market. In two separate deals at the end of last year the company offered TWA and American Airlines short-term operating leases on a total of 35 new Super 80s at very favourable terms. Those two orders helped push McDonnell's order book up to $10bn at the end of the year.

McDonnell Douglas recognises the risks involved in such leasing packages and has said it will require $700m in financing, but believes the packages were necessary to preserve production.

Alternative

The alternative, an unacceptable one at present for McDonnell Douglas, is to follow much of the rest of the industry into the arms of the Pentagon. Last year about 55 per cent of McDonnell's sales came from military aircraft and another 18 per cent from spacecraft and missiles, and its current order book is about 90 per cent military.

The company, the main contractor for the controversial F18, would like to see a more balanced order book but believes it unlikely that it will ever again achieve the 50-50 split reached in 1978-1979.

At Boeing, which manufactures Minutemen missiles and does work on the MX, U.S. government sales represented 35 per cent of the total last year. At Northrop, a 40 per cent partner in the F18 and manufacturer of the F5 as well as a fuselage sub-contractor for the Boeing 747, the figure was 76 per cent. Grumman's sales come 79 per cent from the U.S. government.

General Dynamics, the largest U.S. defence contractor, which builds F-111 parts, the F-16 and the Tomahawk Cruise missile, received 88 per cent of its $6.15bn sales last year from the U.S. government. As with the other main aerospace companies, the percentage of earnings derived from government business is even higher.

Military sales have been a major factor in the industry's survival, for example McDonnell has been able to keep the Long Beach DC-10 production line running only because of a $2.7bn Pentagon order for 44 KC-10s, the military version of the commercial jet.

But that is not to say military business is without its risks. For example, both McDonnell Douglas and Northrop are acutely aware that the F18 programme, with 1,366 jets ordered, is still under attack in Congress.

Northrop, which decided to go-it-alone with the Tigershark jet designed to meet the requirements of "friendly" Third World nations, has yet to win a single firm order. It has spent more than $447m in development and start-up production so far and is expected to spend another $165m this year.

The heavier reliance of the U.S. aerospace industry on military spending has coincided with a more conservative approach to the massive risks in developing new commercial jets — an expensive game of crystal ball gazing which often appears to depend on reading the market 20 years ahead.

Boeing has pushed ahead with its two new airliners, the 757 and 767 but, like McDonnell Douglas, has blown cool on prospects for the new 150-seater jet some airlines like Delta have urged.

Boeing is committed to spending $10m a year on development of such a jet for the 1990s and is also prepared to meet a challenge with a 737 derivative. McDonnell Douglas, on the other hand, believes its Super 80 and other DC-9 derivatives like the DC8S which Alaska airlines has just ordered, can stave off airline demand for a new jet "until the economics are right."

Paul Taylor

The U.S. Lockheed TR-1 high-altitude single-seat reconnaissance and surveillance aircraft designed to provide all-weather information in both peace and war

PERFORMANCE OF U.S. AEROSPACE COMPANIES

	Sales 12 mths. 1982 ($m)	% change from 1981	Earnings 12 mths. 1982 ($m)	% chnge. from 1981	Sales 1st qtr. 1983 ($m)	% change from 1982	Earnings 1st qtr. 1983 ($m)	% chnge. from 1982
Boeing	9,035.0	− 8	292.0	−38	2,989.0	+43	90.0	+ 48
General Dynamics	6,154.5	+29	160.5	+ 9	1,827.1	+47	56.8	+101
Grumman	2,056.7	+15	90.3	+22	509.1	+ 8	22.6	+199
Lockheed	5,613.0	+ 8	207.3	+34	1,415.8	+24	51.6	+ 38
Martin Marietta	3,526.5	+ 7	91.6	−54	801.9	+ 2	13.8	− 13
McDonnell Douglas	7,331.3	− 1	214.7	+22	2,074.9	+21	59.9	+ 24
Northrop	2,472.9	+24	5.4	−89	730.2	+48	7.3	n.c.
United Technologies	13,577.1	− 1	426.9	− 7	3,535.4	+10	110.1	+ 15

The Canadian aerospace industry is small but highly active and has specialised particularly in the development of light transport aircraft capable of short take-off and landing (STOL). De Havilland of Canada has been successful in the commuter aircraft field with its Dash Seven 50-seat four-engine transport (above) and is also building the smaller twin-engined 36-seat Dash Eight.

Exports aiding resilience

France

THE FRENCH aerospace industry has been feeling the pinch from the world recession, domestic defence cutbacks, and the financial difficulties of some client countries. But compared with the general malaise of the bulk of companies in the public sector, the mainly nationalised or state-controlled aerospace groups, while not exactly blooming, have shown evidence of healthy resilience in the last two difficult years.

The main bolster against misfortune has come from exports —especially from military orders, which make up about two-thirds of all foreign sales.

With the civil aviation market depressed by the economic slump and the financial difficulties of world airlines, Airbus sales have been hit hard—although as the French-led consortium (and the Paris government) never tire of pointing out, it has done better than its main competitors Boeing and McDonnell Douglas.

More than ever, then, military favourites have been making the running. Technical data on the Mirage 2000 and Super Etendard jets and the Exocet missile (which both became well known during the Falklands war) are now essential items in the glossary of commercial phrases which French Ministers take with them on trips to countries in the Middle East or Asia.

Both the two main state-run aerospace companies, Aerospatiale (with a turnover of about FFr 21bn ($2.9bn) and a workforce of 36,000) and Dassault-Breguet (turnover FFr 13bn, workforce of 16,000) have recently taken measures to adapt production to falling demand. The aerospace sector as a whole, with a workforce of 116,000, has been an important creator of jobs in recent years, but now faces leaner times.

Partner

Aerospatiale, which as well as being the main partner in the Airbus consortium also makes helicopters, missiles (not only Exocet, but also ballistic missiles for the "force de frappe") and rockets (including the European space launcher Ariane), has been hit particularly by a dramatic cut in helicopter orders on the U.S. market. The company's profit last year is believed to have been well down from the FFr 400m in 1981.

Dassault makes Mirage jet fighters as well as the Super Etendard and the Falcon executive jets. Although export orders for the Mirage 2000 and F.1 have stood up well—among others, from India, Peru, Egypt and Iraq — the company has been affected by a cancellation of French Air Force orders and the downturn in civil sales.

Matra, the diversified arms and electronics group, owned 51 per cent by the state, is still chalking up profits from its missiles sector. But like Aerospatiale, Matra has achieved sales of satellites below expectations, mainly because of heavy competition from the U.S. on world markets.

To face up to the problem of "Franco-French" competition between the two companies to win foreign customers, the Paris Government is proposing that Aerospatiale and Matra pool their sales efforts for satellites and enter into other kinds of industrial collaboration—a step which the companies up to now are resisting.

Turnover of the whole French aerospace sector last year rose 19 per cent (well ahead of the roughly 10 per cent inflation rate) to FFr 52bn, according to preliminary estimates from the industry grouping GIFAS. Showing the overwhelming importance of export sales, foreign orders climbed 26 per cent to FFr 44bn, with foreign deliveries rising 22 per cent to FFr 33bn.

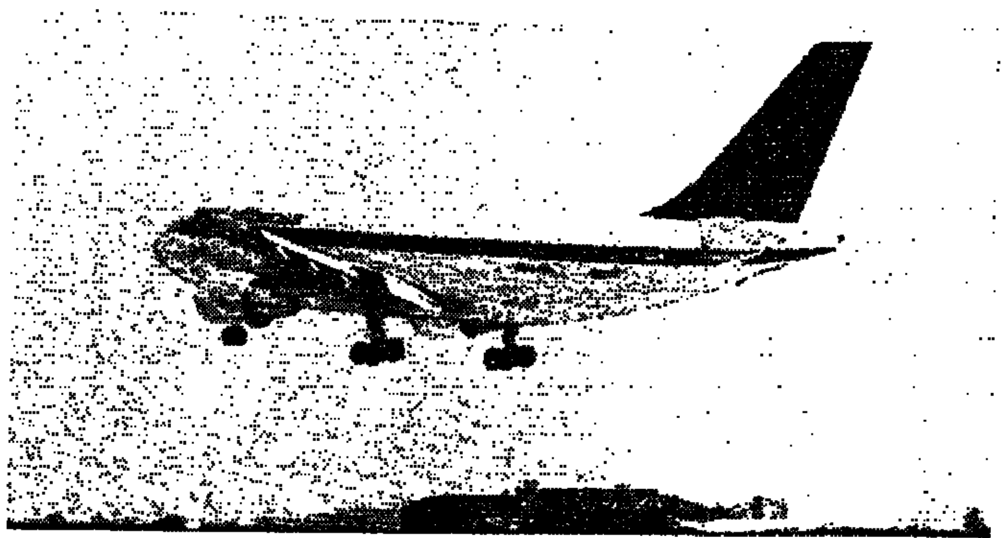
The industry has a net foreign trade surplus of about FFr 23bn, putting it in the forefront of the country's currency earners.

The problems facing the Airbus consortium were underlined in January when Gen Jacques Mitterrand, chairman of Aerospatiale, warned in a memorandum leaked to the Press that the Airbus programme was "preoccupying." The Airbus Industrie chairman, M Bernard Lathiere, promptly hit back by saying that Gen Mitterrand's remarks represented a present worth millions to Boeing, and pointed out that with orders of about 130 aircraft in hand, the consortium still had enough work for 2½ years.

Gen Mitterrand—who retires from Aerospatiale this month on his 65th birthday—is particularly worried about the lack of a European decision so far on the plan for a new 150-seater Airbus A-320.

Apart from the programme with Italy to build jointly the ATR 42 regional airliner, few new projects are on the horizon in either the aviation or the space sector (where important details over future development of the Ariane range still have to be decided). This is a big cloud hanging over the companies' research and development teams.

David Marsh



The A-310—built by Airbus Industrie, in which West Germany is a partner—is a shortened version of the A-300 wide-body airliner with a new wing which provides big fuel savings, as a result of lower weight and drag

Jobs squeezed by drop in orders

W. Germany

THE WEST GERMAN aerospace industry is in a most uncomfortable position, wedged between a stubborn recession in civil air transport and frozen government spending on military aviation.

Problems came to a head last autumn at Messerschmitt-Boelkow-Blohm (MBB), which accounts for two-thirds of the industry in its narrow sense. MBB, which is the end product of a series of mergers that has absorbed all but Dornier and MTU, the engine manufacturer, of the main companies, announced changes which would reduce the workforce to 34,500 in the course of this year from 40,000 at the start of 1982 and including 2,500 redundancies.

The shock of this announcement was compounded in January when Prof. Gero Madelun, a gifted aircraft engineer in the German post-war tradition (and nephew of Willy Messerschmidt) was replaced as chief executive by Dr Hanns Arnt Vogels, a former partner in the Flick industrial group of Dusseldorf.

As well as being MBB's fourth chief executive in six years, Dr Vogels is also the first not to have a technical background in aviation, although Flick is in the armaments business through its subsidiaries Krauss Maffie and Dynamit Nobel.

The problems highlighted by the lay-offs and management changes lies at the very basis of the new MBB, which completed the takeover of Vereinigte Flugtechnische Werke in Bremen in 1981 and now turns over DM 5.6bn.

Despite the scattering of the new concern between VFW's works on the north coast and MBB's base in Bavaria, and the absorbtion problems MBB has never sought to play down, the merger offered the possibility of mutual support between the civil side of VFW and the predominantly defence-oriented MBB.

However, with sales of the Airbus A-300 and A-310 in the doldrums and marked lack of enthusiasm for a new A-320 (not least from Lufthansa, that does not seem to want a 150-seat airliner), MBB has also found that the election of a conservative government in Bonn has done little to lift the military procurement budget.

Defence spending for 1983 will see only a marginal increase over last year in terms adjusted for inflation and Dr Manfred Woerner, the Christian Democrat Defence Minister, has said he will wait for the increases the Bundeswehr badly needs until overall state finances are in order and net borrowing (DM 40bn ($16.6bn) for 1983) falls.

Harder

Back at MBB, the federal states that are the main shareholders have had to accept that the workforce in the constituencies will shrink to at least 35,000 by the end of the year. However, they demanded in January that a harder and more political chief executive should replace the gentle Prof. Madelung.

Dr Vogels, the candidate of the Bavarian public sector representatives, was adopted as a man with a reputation for good contacts in Bonn while Prof Madelung stepped down to head the military aircraft division. "I'll never be able to build an aircraft," Dr Vogels said in January. "But when I've done some homework and know the company, I'll market MBB products as the best in the world."

However, the problems do not stop here and the states will probably have to accept a further reduction of the workforce of about 2,000 by 1985. "I cannot promise miracles for the workforce, least of all in the short term," Dr Vigels said.

One problem is that MMB is caught in the cycle of defence expenditure, and new procurement decisions must be taken by Bonn at once to maintain capacity in the second half of the 1980s.

Production of the Tornado multi-role combat aircraft, a joint venture with Italy and the UK, has been cut by a third at MBB to meet Bonn's tight purse. The Luftwaffe allotment of 324 aircraft will probably be complete by 1988 and all hopes for keeping the MBB line at Manching open will depend on exports.

What is needed, MBB officials say, is a speed decision from Paris and Bonn to go ahead with the joint PAH-2 military helicopter project and movement on a new European fighter aircraft for the 1990s.

Aerospatiale and MBB completed a definition phase for the attack helicopter last year, but there remain differences of opinion between the two armed forces over the role of the aircraft, the French insisting on a heavier anti-helicopter and general purpose ground-attack machine while the Germans want a simpler update of the PAH-1, based on MBB's BO-105 civilian helicopter.

The hope is, however, that political will in Bonn for a new joint project with France could overcome the differences over specifications.

If a decision is taken this year, delivery of about 450 aircraft could begin in 1986.

The difference in requirement for a new European fighter aircraft are even more marked although it is now thought improbable that Germany could go it alone with its own fighter to replace the F-4 Phantom for the Luftwaffe in the 1990s.

Both MBB and Dornier, which worked with Dassault on the Alpha Jet, are developing concepts and there have been talks between the governments of the UK, Italy and West Germany towards finding a joint basis for an Agile Combine Aircraft (ACA) for the 1990s. MBB has developed a carbon-fibre fuselage for its proposed model. But what will eventually emerge in the European skies in the 1990s is far from clear.

James Buchan

Intense battle to hold on to sales

Netherlands

FOKKER, THE Dutch aerospace group, has spent much of the last 12 months taking a long, hard look at itself. The period of reflection has done it no harm at all.

At the beginning of 1982, the company was on the floor. The McDonnell-Douglas link that was to have transformed the Dutch group into a volume manufacturer of large, medium-range aircraft had been severed: the F27 and the F28 were going grey around the muzzle and the British Aerospace BAe-146 commuter liner looked like taking off into a bright future—at Fokker's expense.

Nor did the 1982 financial results give much cause for cheer. Although turnover increased by 4 per cent, to Fl 1.35bn, operating profit remained stuck at Fl 16.8m, and a 250 per cent surge in financing costs left the company with a net loss of Fl 10.2m. At the same time, as customers found themselves unable to take delivery of aircraft ordered, stocks rose alarmingly and dismissal notices were sent to 1,400 employees.

What happened next probably can be put down to experience and a wonderful concentration of minds. Fokker's senior management, under the redoubtable Mr Frans Swarttouw, decided to press hard for sales of the F27 and F28—new versions of which seem to come along every three months—and at the same time looked ahead, both into the middle distance and into the 1990s, for projects which would restore the dynamics of a somewhat moribund company.

Spirit

No magic wand was waved (Fokker still has serious problems to overcome), but something of the old spirit was revived, so that managers, researchers, and assembly workers began to feel that recovery was a practicable proposition.

Sales first. Last year, Fokker sold 12 F27s (16 in 1981) and 22 F28s (13). Of the F28s, 10 were ordered by Garuda, the Indonesian state airline, which has for years put its faith in Fokker and which probably did more than any other customer to ensure that the workforce at Schiphol was not cut back further than it was. A total of 752 F27s has now been sold to 160 operators in 61 countries, while 206 F28s have been handed over to 47 operators in 32 countries.

More recently, Fokker has succeeded in selling three of its type 4000 F28s to East-West Airlines of Australia, another customer with which it has a long association. It had been feared that the BAe-146 would usurp Fokker's position here, but the availability of stock aircraft—a bonus from the recession—plus the fact that the Dutch were able to convince East-West that their venerable product was as technologically advanced as its rival, finally gave the F28 the edge.

Fokker is particularly pleased with the East-West deal. "British Aerospace pulled out all the stops in Australia, but we still came out ahead," one senior manager remarked. That is certainly true. BAe and Fokker have been engaged in strong rivalry in the South Pacific in recent months, bouncing claims on to their potential customers' desks with unrelenting industry.

Fokker agrees that the 146 is quieter—it may indeed be the least noisy airliner in the world—and accepts that this is an increasingly important factor. But it insists that the F28 is ahead in the fields of fuel consumption and maintenance.

To keep the F27 and F28 up to date is a perpetual process, and the makers say that both aircraft bear only a superficial resemblance to their original designs. Large sections of both have for some time been made of glass fibre composite materials, but a new structural composites plant was opened at Hoogeveen last September with a view to further improving the process and both lightening and strengthening the materials.

The company expects that the new technology of advanced fibre reinforced plastics will play an ever-increasing role in future aircraft structure. Avionics are also being improved, while in the vital field of engineering Fokker is building on its established relationship with Rolls-Royce and, simultaneously, encouraging Pratt and Whitney to come forward with alternatives.

But if Fokker is enjoying a degree of recent success on the sales front, it has also had to take on the tricky problem of buy-backs. East-West, in addition to its F28 orders, is to buy six of the latest F27s. The snag is that the Australian venture made the trade-in of 10 older type F27s part of the deal. Garuda similarly handed back 20 of its older F27s, and the result is that Fokker takes one step forward and two back. Somehow, homes have to be found for all.

The other major current project at Fokker is the F-16, the U.S.-designed fighter, now being assembled at Schiphol. F-16 technology, and the management techniques required for military production schedules, are proving of great benefit to Fokker, and the assembly line itself employs about 1,300.

The fighters, among the most advanced in the world, are being produced for the Dutch and Norwegian air forces, but there is also a strong expectation that the U.S. Air Force in Europe will have its F-16s maintained and repaired by Fokker. This could prove very lucrative.

Fokker's on-off involvement in the European Airbus project has settled down in the last few months. Six months ago, Mr Swarttouw said that he wanted to join the consortium building the new A-320 Airbus. Moreover, he wanted substantial participation, 15 per cent was not enough. "It is precisely what I don't want, it is too little," he said.

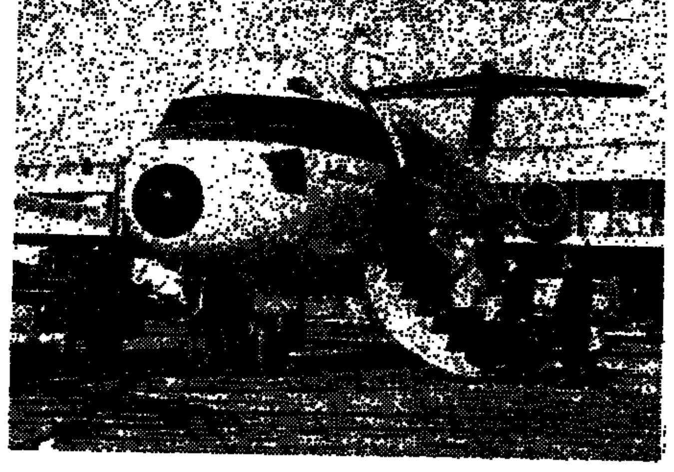
Now he has backed off, no longer convinced that the 320 will secure a big enough place in the world market. He is apparently content, for the moment, to remain associated with Airbus Industrie through the manufacture by Fokker of carbon fibre landing doors for the A-300-600 and wing parts for the A-310.

Looking to the future, Fokker is carrying out preliminary research on a new generation propellor-driven aircraft, which could fly as fast as present-day fan-jets but at half the cost in terms of fuel. A prototype could be ready within the next few years, ready for sale in the 1990s.

Fokker's other concern, beyond aircraft, is satellites. The European Infra-Red Astronomical Satellite (IRAS), on which it worked in the Netherlands alongside Philips, was launched into orbit in February and is now operational. All is well, and the unique telescope the satellite employs for its survey of infra-red sources in the universe, could remain in space for 300 days instead of the 200 originally planned.

Philips space systems, including Hollandse Signaal, is heavily engaged in the IRAS project but, like Fokker, is involved as well in a variety of satellite experiments. The range of activities is widening and both companies see European co-operation as essential for the success of the various space ventures.

Walter Ellis



The Dutch Fokker F-28 twin-engined Fellowship is one of the most successful jet airliners in production today, with orders for more than 200 aircraft, of which over 180 have been delivered.

Component maker feels the chill

Belgium

ALTHOUGH BELGIUM has one of the smallest aerospace industries in Western Europe, it has nevertheless established for itself a significant niche in the international aerospace community by virtue of its wide range of activities. These extend through final assembly of advanced military aircraft such as the U.S. General Dynamics F-16 fighter, the manufacture of parts for the European Airbus, equipment for space vehicles such as the European Ariane launcher, and advanced electronic systems for military and civil use.

The industry is centred round three major companies — Société Anonyme Belge de Constructions Aéronautiques (Sabca), and Société Nationale de Construction Aérospatiale (Sonaca), on the airframe side, and Fabrique Nationale Herstal (FN), on aero-engines. These are supported by a wide range of ancillary equipment, component and electronics companies.

Wing slats

The wing slats for the A-310 Airbus are made by Sonaca in Belgium and sent to Bremen, where they are fitted to the wing which comes from British Aerospace at Chester before the whole assembly is sent to Toulouse to be mated with other major parts of the aircraft.

Sonaca is the main contractor handling Belgium's share of about 3 per cent in the Airbus. The parts it makes and the size of Belgium's participation in the project indicate the role played by the country in the international industry.

Belgium is a component maker and sub-contractor for major aerospace groups elsewhere. When these groups feel the cold of recession, the Belgian industry has to wrap itself up warmly. Over the last year it has felt the chill as military aircraft buying plans have been spread out and as the civil airlines have coped with their overcapacity by adopting more cautious buying policies.

The early post-war development of the industry largely took place in collaboration with the British, but latterly first the French and then American manufacturers have played a more dominant part in the supply of technology and in the provision of business for Belgian companies engaged in offset arrangements.

The biggest single boost for the industry has been the decision of the Belgian Government to buy 44 F-16 fighter aircraft, made by General Dynamics with engines from Pratt and Whitney, from the U.S.

But 58 per cent of the value of the aircraft will be offset by manufacturing and assembly in Belgium. Most of this work will be done in the French-speaking area of Wallonia, the heart of the Belgian aerospace industry.

It is in this area that, for example, Fabrique Nationale Herstal (FN) makes the F-100 engine to be used in the aircraft.

There is another element in the agreement with the U.S., however. It is a 22 per cent indirect offset for the Flemish-speaking area of Flanders. The trouble taken to reach this figure, and the pressure exercised in Flanders to make sure of the province's participation, is a harbinger of the difficulties likely to be involved if the Belgian Army decides to buy new helicopters.

Regional politics have entered the Belgian industry. With the support of the Flanders regional executive and employers organisation, a new organisation called Flemish Aerospace Group (Flag), has been set up to marshal the efforts of small and large companies alike and to undertake marketing work.

Flag is now claiming that in future aircraft deals the offset arrangement should be 100 per cent Flemish. The claim is based on the longstanding demand for a greater share of central government spending to be placed in Flanders.

As the region has more people and makes a bigger contribution to national exports than Wallonia, then in the future it should have a bigger part of the business coming in abroad, it is argued.

Equality

Because the greatest share of the work in the past has gone into Wallonia so in the future more should go to Flanders to achieve equality of regional development.

In the longer term, however, Flag is hoping to encourage joint ventures between Flemish companies and overseas groups so that a transfer of technology will be achieved eventually leading to greater indigenous research, development and manufacturing.

But this general policy has for years been followed by Gebecoma, the federation of Belgian aerospace constructors. The organisation has 10 members of which five are in any case members of Flag—ACEC, Bell Telephone, MBLE, OIP Optics and Sait Electronics.

Flag believes that the indirect offset agreement it has for the F-16 could be worth some BFrs 10bn ($104m) over 10 years to Flemish business. Despite this, industrialists outside the region believe that a Flemish aerospace industry on the lines of Flag's conception is an aspiration rather than a fact.

Certainly the major companies in Wallonia are well-established. Their lynchpin is FN, 35 per cent of whose activities are in aerospace. FN has the biggest private shareholder. 24.4 per cent of Sonaca and is It also has a 20 per cent stake in Belairbus, the holding company, which acts as a link between government and industry for the Airbus programme.

In the Brussels area, Sabca, the oldest Belgian manufacturer, but now controlled by Dassault of France and Fokker of the Netherlands, has seen recently its share price rise to record levels. It is the largest airframe component maker in Belgium. At its Gosselies plant it undertakes final assembly of the F-16 for the Belgian and Danish air forces.

All three of these companies stand to gain from the decision to purchase the second generation F-16.

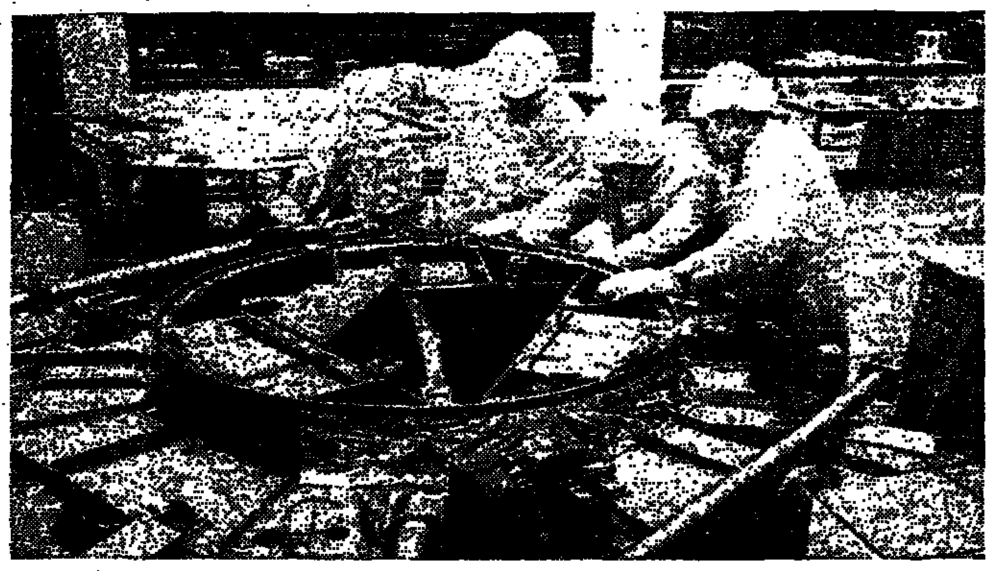
But for FN this is not sufficient. Europe, the group notes, is simply not a big enough market to sustain its engines division. Yet in the case of the F-16 engines its destiny is to a large extent out of its hands.

The marketing of the F-16 is a U.S. affair and the difficulties of the recession have been forcing governments to stretch out their buying programmes. FN is looking increasingly to the U.S. both for machinery and for engine maintenance.

So its strategy to come through the years to 1986 is to win work from the U.S. Air Force while awaiting the start of work on the new aircraft for Belgium and seek to participate in international programmes involving buyers like those in the Netherlands, Norway and Denmark.

The group is an example of the way the Belgian industry will be forced to develop if profits are to be made. It has to win for itself a place in the programmes of others.

Paul Cheeseright



Sweden's first satellite during tests in Saab-Scania's integration hall in Linkoping

JAS project is largest ever defence contract

Sweden

FOUR YEARS AGO, the Swedish aerospace industry had neither a continuing military construction programme nor a commercial one; but the climate has changed.

Last year, the industry won an order for Sweden's next combat aircraft, code-named JAS 39; a consortium former between SAAB-Scania and Fairchild Industries of the U.S. has flown its first regional airliner, the twin turbo-prop SF 340, with deliveries due to start next spring. Sweden is also preparing to move ahead on a Nordic telecommunications satellite known as Tele-X; and its Viking space research satellite is completing final testing at the European Space Agency.

The JAS project is the largest defence contract ever placed with Swedish industry. It calls for delivery before the year 2000 of between 130 and 140 aircraft with weaponry and equipment. Total value is SKr 24.9bn ($3.3bn) at 1981 prices. The operating life of JAS is planned to extend well into the next century.

An initial SKr 10bn contract for production of the first 30 aircraft was awarded by the Swedish Defence Materials Procurement Agency to a special aerospace industry group headed by SAAB-Scania last June.

The decision to proceed was pushed through Parliament last year despite opposition by the Social Democrats, who were sympathetic to concerns that the aircraft might become obsolete within its operational lifetime. Once in power, they gave their stamp of approval following an investigation which dispelled lingering doubts.

However, the programme's cost was reduced by SKr 800m to the original estimates, and Parliament has insisted on strict adherence to budget targets. The June 30 contract spells out penalties if the single-engined aircraft fails to meet performance, operating and maintenance standards. Mr Anders Thornberg, the Defence Minister, stated in recent Parliamentary discussion that it might be necessary to delay purchase of about 10 aircraft to stay within target.

The JAS programme was chosen against competing American proposals. It has saved SAAB-Scania's ability to design and produce its own military aircraft, as well as 6,000 of 13,000 jobs in the aerospace industry.

Systems

The JAS Industry Group includes SAAB-Scania which is responsible for about two-thirds of the work. It will handle the airframe construction and systems integration. Volvo Flygmotor is co-producing the F-404 engine, which powers the F-18 Hornet, with General Electric of the U.S. The Ericsson Telecommunications group is producing the radar, sensor equipment, target acquisition systems and cockpit displays.

The aircraft has been designed to carry out attack, intercept and reconnaissance missions. Like its predecessors, the Viggen and Draken, it is built for simple maintenance, but is less dependent on ground support and equipment.

To avoid a rush development programme, SAAB-Scania signed a contract with British Aerospace last December. BAe will design and produce the load-bearing section of the wings to be used on the four prototypes. SAAB will take over during production build-up in the early 1990s.

When the predecessor to the current JAS development programme was cancelled by the Government in 1979, the SAAB Board resolved to cut its dependence on military contracts. The result was the SAAB-Fairchild joint venture for the 34-seat SF-340 regional airliner.

The first prototype made its maiden flight from Linköping, Sweden, this January, exactly three years after the programme was initiated. A second aircraft is joining the test schedule in May and a third in August.

This the first airliner designed to meet both U.S. and European standards, according to officials who hope that it will receive simultaneous certification when it reaches 1,000 hours of flight testing. Deliveries of the first 30 aircraft are planned for soon afterwards, in spring 1984.

The SAAB-Fairchild group has set up a finance company with Citibank as the lead bank, and a new marketing arm. It announced the loss of 10 orders in the U.S. Late last year due to poor economic conditions, and has re-estimated its firm orders at 100 aircraft.

With an anticipated upturn, officials hope the SF-340 will be able to capture a sizeable share of a market they estimate at between 1,500 and 2,000 aircraft by the year 2,000. The break-even point is 200 aircraft at $5m each at 1982 prices.

On the space technology side, the Swedish Parliament is expected to approve a Bill allocating funds for a Nordic telecommunications satellite project known as Tele-X. Initial start-up funds would be Skr 575m, with an estimated total project cost of SKr 1.3bn to be shared with Norway and possibly Finland.

David Brown

Difficult year ahead

Italy

ITALY'S AEROSPACE manufacturers are now coming to terms with an unaccustomed circumstance — that 1983 is likely to be a difficult year for the industry.

Until now, aerospace has been one of the quieter, but nonetheless genuine, success stories in an industrial landscape dotted by such disasters as steel and chemicals, both regularly losing hundreds of billions of lire annually.

The aerospace sector's total turnover has climbed from L740bn ($507m) in 1977 to L2,200bn for 1981, of which three-quarters went for export. Final figures for 1982 have not yet been prepared, but a further substantial growth is likely to have been achieved, again largely generated abroad.

This year, however, may well see problems, especially from summer onwards. The reasons are familiar: the acute financial difficulties of civil airlines (which have already been cutting back orders), the shortage of available finance for potential buyers from developing countries and the scarcer resources of oil producer nations, are leading them to slow down their expansion programmes.

All this, however, is for the future. The results thus far reported for 1982 by Italy's major aerospace manufacturers suggest that the uptrend, until then, continued. Aeritalia, the country's leading producer and a subsidiary of the huge IRI-Finmeccanica state-owned conglomerate, announced that sales had risen by 52 per cent to L800bn ($570m) and that net profits would be double the L2.2bn achieved in 1981. Orders in hand at the end of last year stood at L1,550bn ($1.07bn).

Aermacchi, the smaller Varese-based concern, of which Aeritalia now holds 25 per cent, reported a comparable advance in turnover to L183bn ($126m), and earnings of "several billion lire." A healthy expansion in sales is also expected from Agusta, the second-ranking company in the sector, controlled by EFIM, another state-controlled industrial holding company.

The activities of the aerospace sector are of a breadth reflecting the profound change it has experienced since the mid-1970s. Italy's manufacturers used to be specialists, concerned with marginal and basically small-scale programmes. Today, they are key participants in several of the largest international projects under way—in both the military and civilian fields.

The most eye-catching military programme is, of course, the Anglo-German-Italian multi-role Tornado strike aircraft, in which Aeritalia is the Italian partner, and of which 100 have been ordered by the Italian Air Force. But considerable hopes are pinned on the new AMX light attack and battlefield support aircraft, being developed by Macchi, Aeritalia and Embraer of Brazil.

Test flight

Already the air forces of the two countries have placed orders for 266 of the aircraft, to be priced at between $8m and $10m each. The first test flight of the AMX is due by the end of this year, and the main concern of the manufacturers is less technological than whether the Italian Parliament (now dissolved ahead of the June 1983 general election) will approve disbursement of the L470bn of Government funds allocated for the AMX.

Such apprehensions indeed illustrate one of the perennial problems faced by the industry —the bureaucratic obstacles inherent in Italy's rusty administrative machinery. Failure of promised official help to materialise has led frequently in the past to a heavy reliance on expensive borrowing from banks, and the ensuing burden of high debt servicing charges.

Agusta, of course, is heavily involved itself on the military side, especially in helicopters. Final agreement on the project to build a new range of helicopters, the EH-101, in conjunction with Westland of Britain, is expected shortly. In the meantime, its subsidiary, Siai-Marchetti, is promoting its S-211 military light trainer.

The most striking civil involvement remains Aeritalia's important role in the Boeing 767 programme, which is likely to be a backbone of the company's activities for several years. But progress on the ATR-42 short haul "commuter" aircraft, on which it is co-operating with Aerospatiale, its French opposite number, is also running smoothly and ahead of schedule.

However, increasing importance has brought with it increasing responsibilities and pressures, both at home and abroad. An example of the latter has been the campaign mounted by France to enlist Italian support for the A-320, the planned entry of Airbus Industrie, the multi-national European consortium, into the competition for the new generation of 150-seat airliners.

At home, too, the success of the aerospace industry has focused attention on the need to reorganise its structure. A first step was the acquisition by Aeritalia of a minority interest in Aermacchi. Far more important is the future relationship between Aeritalia and Agusta. Last year, Sig Gianni de Michelis, the outgoing Minister for State shareholdings outlined a plan to effectively merge the two by the transfer of control of Agusta from EFIM to IRI. But the scheme seemed somewhat improbable from the outset, above all because of the rivalry between the two companies and their two parents.

EFIM, in particular, would be unhappy to lose perhaps the best asset it has. After a capital increase from L18bn to L118bn, EFIM's share of the capital of Agusta rose from 51 per cent to 80 per cent. The remainder is in the hands of the founding Agusta family, which in fact would like to sell out.

Whatever happens, some form of truce between the two companies is required—if only to remove wasteful competition between them.

Rupert Cornwell

Industry hopes for bright future

Israel

THE SUCCESSES of the Israeli Air Force in the Lebanese war against Syrian aircraft and ground defences, and the recent U.S. decision to release sophisticated technology for incorporation in the new Lavi fighter, have raised hopes for a bright future for Israel's aerospace industry.

Inquiries about such items as the Israeli-made pilotless drones and electronic warfare equipment have brought new orders which, it is hoped, will help the aerospace and allied industries recoup some of the losses of last year.

Israeli Aircraft Industries (IAI) dominates the business and is also the country's biggest company in terms of sales, exports and number of employees. Among its 350 products is the Kfir jet fighter which performed creditably as a ground attack aircraft in the Lebanese war. The latest in the Kfir line is the C7 with improved performance and upgraded avionics.

However, despite persistent reports of pending deals to sell the Kfir to one country or another, the latest being Honduras, there is no confirmation that any of these deals has been agreed.

After a particularly good year in 1981-82 when total sales reached a record $822m and exports grew to $517m, the company's financial report for 1982-1983 is expected to show almost a 10 per cent decline in sales and exports as comprising less than 50 per cent of total sales.

One of the first actions of Israel's new Defence Minister, Professor Moshe Arens, a former deputy Director-General and head of the engineering department at IAI, on taking over in February was to announce that the $210m for Lavi development this year will be provided out of the defence budget.

Willing

Development of the Mach 1.8 Lavi, whose first flight is scheduled for the end of 1985, gives a much needed boost to IAI which, without this project, would have faced a gradual decline in size with the winding down of Kfir production in the coming years.

The Israeli Air Force is willing to take 300 Lavis which is expected to provide employment for 12,000 people. Looking remarkably like the F-16, but with canards, the Lavi's primary function will be close and medium range air-to-ground missions with a secondary air defence role.

Beth Shemesh engines, originally set up by Turbomeca, is already tooling up to produce the Pratt and Whitney PW1120 engine which will power the Lavi. Like IAI, which wanted the engine too, this contract probably saved Beth Shemesh from an increasingly perilous future.

The recession in the West which hit the business aircraft market, also spelt bad news for IAI's Westwind executive jet whose sales fell last year. But the company is more optimistic about its new generation Westwind Astra which is due to roll out of the hangar in September this year, and go into production in 1985. Already it has orders for 20 Astras, mainly from buyers of the earlier Westwind models.

Israel's Arava Stol aircraft has still failed to live up to marketing expectations, even though about 60 of them are already operating in central and southern America. IAI is still pursuing sales for this aircraft, but there are considerable doubts that it will ever return its development and production costs.

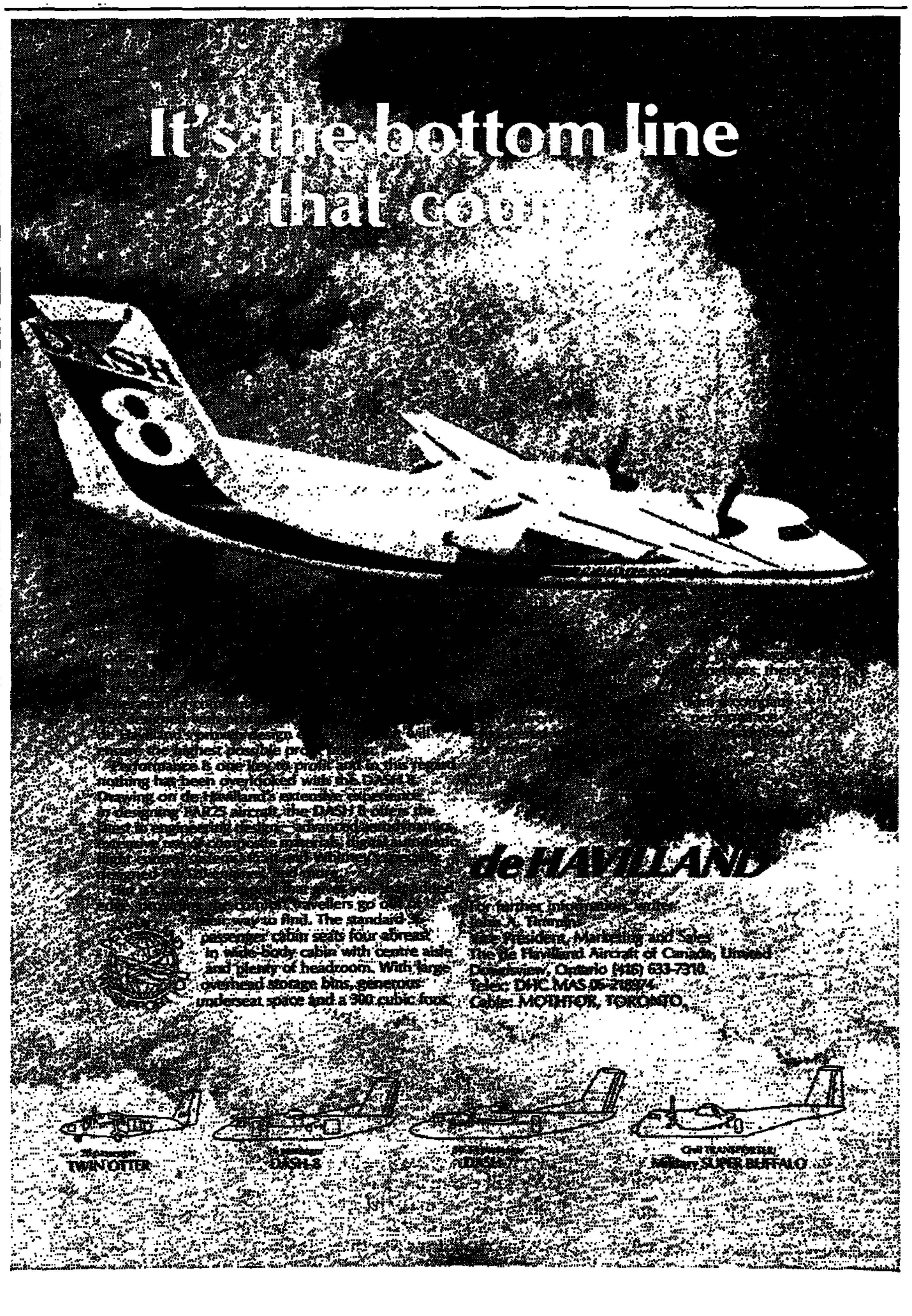
IAI reports deliveries of the Scout to a number of customers, including some European countries, as a result of the interest generated by its war successes. Because of its fibreglass construction the Scout has almost no radar signature.

The highly-successful Gabriel sea-to-sea missile has now been joined by an air-to-sea version and IAI has also improved its Barak Naval Point defence missile with a vertical launch version which takes up minimum space on a ship's deck.

The Gabriel, which is already in service with the Argentine Navy, may also make a breakthrough into the Brazilian market, though there are reports that the Brazilian Foreign Ministry has voiced objections to the Navy's desire to buy the Israeli weapon.

A new Israeli-made air-to-air missile, Python 3, which brought down several aircraft in the Lebanon war, was unveiled this year by Rafael, the Defence Ministry's armaments development authority. The heat-seeking, super-sensitive infra-red detector of the Python allows it to be fired from "practically any" direction, according to Rafael Director Mr Zeev Bonen.

David Lennon



Successes and constraints

Brazil

WITHIN TWENTY years the Brazilian aerospace industry has grown from scratch into one of the most diversified, and successful, in the developing world.

However, it has also suffered periodically from financial constraints. In recent years these have worsened, forcing a greater emphasis on the development and export of highly-profitable equipment.

Success came originally for Brazil from the adoption of tried and tested principles—learnt from the experience of others—and then their consistent application, with military order and directness.

A mastery of relatively unsophisticated aviation technology in the 1960s and early 1970s provided the foundation stone. A twin-engined turboprop, the Bandeirante, was a surprising success, both at home and abroad.

Licensing arrangements with two foreign manufacturers—Piper, in the U.S., for light passenger aircraft and Aermacchi of Italy for military jets—became another platform for the development of an indigenous industry.

The decision to rely on one supplier, Pratt and Whitney, for most engines powering Brazilian-made aircraft may have been a little risky for a Government emphasising the national independence aspect of its approach to the industry. But the advantages of cost and standardisation were clearly judged to be more important.

Brazil's military-led Government has always played the leading role in this field through, for example, its control of Embraer, the major manufacturer of civil and military aircraft.

Strategy

Equally important was the way in which it implemented during the past decade the straightforward strategy of closing the doors to foreign competition, and then sending out the salesmen in search of foreign markets as soon as Brazil had tested products to sell.

The Brazilians' highly protectionist attitude towards their domestic market still rankles with Western competitors, who see Embraer in particular making inroads into their traditional markets abroad.

The U.S. continues to press its case for access to Brazil for American commuter aircraft whenever possible. On the other hand, its international trade commission last year came down in favour of Embraer's exports to the U.S. of the Bandeirante, against an anti-subsidy case lodged by its competitors.

In fact, Embraer depends to a considerable extent on foreign technology and components. Its most ambitious new venture, a supersonic interceptor aircraft known as the AM-X, is a joint project with Aermacchi and Aeritalia of Italy.

The Brasilia is the new 30-seat twin-engined transport aircraft now under development by Embraer, with a maiden flight scheduled for midsummer.

An average of 60 per cent of the company's components are imported — a percentage which rises sharply in the case of its more sophisticated military aircraft.

The industry as a whole remains relatively undeveloped, dominated by Embraer and Avibras, a privately-owned missiles and rockets company. One major area of potential future growth is helicopters, where the only significant company today is a small joint venture between Aerospatiale and the Minas Gerais State Government.

After good growth in the past decade, the Brazilian industry's domestic sales have dropped off badly recently and the outlook remains bleak.

Over half Embraer's annual sales of approximately $250m come these days from exports. On the civilian side the mainstay remains the sturdy, economical Bandeirante. But this will soon start to be phased out in favour of Brazil's first pressurised aircraft for the airline industry, the 30-seater Brasilia.

The new aircraft, which marks Embraer's entry into the world market as a major manufacturer, is due to test fly next month and come into service sometime next year. More than 150 advance orders have already been placed but it faces strong competition abroad.

In the meantime, the less-publicised military side of Embraer's production line has been growing rapidly. It probably now represents the bulk of the company's earnings, although exact figures are hard to obtain.

Considerable secrecy surrounds Brazil's sales of military aircraft. An Embraer document reveals that up to 1981 at least 71 military or dual civilian/military purpose aircraft had been exported by the company. But the total could now be significantly higher.

After repeated denials by the foreign ministry in Brasilia, an enterprising Brazilian news photographer was recently able to confirm reports that Brazil has sold 12 Xavante ground-attack aircraft to Argentina. His photograph showed the aircraft in Argentine Navy colours on Embraer's airfield at Sao Jose dos Campos, home of the Brazilian aerospace industry.

The Xavante, a version of Aermacchi's M-326 aircraft, powered by a Rolls-Royce Viper turbojet, is known to have been sold to a number of other Latin American and African countries. But the Argentine sale was particularly sensitive, as it comes at a time when the Brazilian company is trying to sell a turboprop trainer/light tactical aircraft of its own design, the Tucano, to Britain's Royal Air Force.

Argentina, along with all the other Southern Cone countries, has also bought the maritime patrol version of the Bandeirante, the EMB-111, which is stuffed full with U.S. and French defence equipment.

Not surprisingly, Embraer has been keen to keep a low profile lately. The fate of what could be its largest ever single sale—a $200m order from Libya for 150 Tucanos and 10 EMB-111s—has been hanging in the balance ever since Brazil last month seized Libyan arms-transporting aircraft on their way to Nicaragua.

Hard hit by high domestic financing costs and a temporary halt in its sales to the U.S. last year as a result of the ITC case, Embraer badly needs the Libyan order. Despite its impressive growth, the company's balance sheet has not looked healthy in the past few years.

Priorities

An additional source of strain is the development costs of the AM-X. Total investment was estimated two years ago at $600m and Embraer has to find a third of that sum.

The recent shift in Brazilian aerospace priorities, away from its embryonic space research programme and into the export of military equipment, is illustrated by the changes undergone by Avibras.

Founded in 1961 as a wholly privately-owned company, Avibras was seen as the main local manufacturer behind the country's $850m drive to put its own satellite into space. A two-stage, solid-fuel rocket developed by Avibras, Sonda-4, is intended to be the launching vehicle.

However, budget cutbacks and Brazil's current severe financial plight have affected plans at the Institute of Space Research at Sao Jose dos Campos. Instead Avibras is these days putting much more emphasis on its military rockets, which have sold well in the Middle East.

In Paris this month the pride of the show for the Brazilian company will be its latest multiple rocket launcher system, Astros-II, which it claims will be a world beater.

Avibras has grown rapidly over the past four years on the strength of its military exports. And if any further proof were needed of the success of this approach, the company can point to orders totalling a staggering $1bn over the next 10 years.

Andrew Whitley

Small but diverse industry

Australia

ALTHOUGH IT is one of the smallest aerospace industries in the world, with a total labour force of about 6,000, the Australian industry is nevertheless highly active.

In recent years this activity has been concentrated primarily on the provision of equipment and services to the Royal Australian Air Force (especially in the modification of and "life-of-type" extensions for training and combat aircraft in air force service), and in the manufacture of components and assemblies, especially for foreign aerospace manufacturers in the UK, U.S. and Western Europe.

The industry is concentrated around three major companies — the Commonwealth Aircraft Corporation (CAC), of Melbourne; the Government Aircraft Factories (GAF), (which is part of the defence production facilities owned by the Australian Government), of Fishermen's Bend, Victoria; and Hawker de Havilland Australia (HDH), a member of the UK Hawker Siddeley Group, of New South Wales.

The CAC is currently engaged on extending the lives of RAAF Aermacchi MB-326H trainers and modifying the Lockheed P-3C Orion for Australia's long-range maritime patrol requirements, and is also involved in the repair and overhaul of RAAF Mirage fighters and Atar 9C, Viper and Avon aero-engines.

Manufacturing activities include parts for the Nomad light transport built by the Government Aircraft Factories, passenger doors for the Lockheed TriStar airliner and escape slides for the McDonnell Douglas DC-10.

The Government Aircraft Factories are currently engaged in the manufacture of the Nomad series of light transport aircraft, which is in service worldwide in a variety of civil and military versions, with total sales of well over 150 aircraft. Production of the Nomad is due to end in 1984, after the completion of 170 aircraft.

Overhaul

The GAF is also busy, however, on manufacture of the Ikara anti-submarine missile and Jindivik target drone; and on wing flaps for the Dutch Fokker F-28 Fellowship airliner; while it is also undertaking final assembly of all but the first two of the 75 McDonnell Douglas F/A-18 Hornet strike fighters ordered for the RAAF.

Hawker de Havilland's major activities continue to be in component manufacture and the provision of overhaul, modification and repair and maintenance services for the Australian defence forces, and for a wide variety of other Australian and overseas customers, both civil and military, including Boeing, British Aerospace, General Electric of the U.S., Lockheed, McDonnell Douglas, Pratt and Whitney and Westland Helicopters.

All three of the main Australian companies—CAC, GAF and HDH—have joined in the formation of a new company, the Australian Aircraft Consortium (AAC), with the aim of designing and developing a new turbo-propeller basic training aircraft, the A-10, intended to enter RAAF service in the late 1980s, while also serving export markets.

The AAC will be the project manager for the £90m venture but will sub-contract all manufacturing activities to the three partner companies. Three prototypes and 69 production aircraft are planned, with deliveries starting in 1988.

In addition, the AAC is studying the possibilities of developing other types of training aircraft, with an advanced jet trainer for the RAAF for the early 1990s particularly in mind.

On the civil side, in addition to the already extensive sub-contracting work being undertaken by the major companies for a wide variety of international customers, it seems likely that the Australian industry will take a share in the development of any new international 150-seater type airliners that may emerge in the future. The major manufacturers involved in planning such aircraft—Airbus Industrie, Boeing and McDonnell Douglas—are all believed to have discussed the possibilities of some Australian participation in their ventures, as and when they are formally launched.

Michael Donne

Modest increase in production forecast for 1984

Expansion levels off

Japan

FROM REMAINING almost stationary in the second half of the 1970s aircraft production in Japan grew very sharply in 1982 as the industry embarked on three major new projects.

Production, however, is likely to expand much more slowly in the current year and prospects beyond the middle of 1984 are uncertain, to say the least. The much discussed "take-off" of the Japanese aircraft industry, accordingly, has yet to materialise, and may not do so for some time to come.

From 1976 until 1980 output of aircraft and related products by the 30 companies that are involved in the Japanese industry fluctuated between Yen 250bn ($1.08m) and Yen 290bn—figures that place the industry well behind those of the UK, France and West Germany. In 1981 output rose to Yen 327bn and during the 12 months ending last March there was a further sharp rise to Yen 440bn.

This reflected the start last year of full-scale production of two new aircraft intended for Japan's self-defence forces together with the Japanese share in the Boeing 767 project.

The defence aircraft which helped to boost production last year were the F-15 fighter and the P-3C anti-submarine aircraft both of which are being manufactured in Japan under licence from the U.S. Defence sources say that full-scale production of these two aircraft started in 1982.

In 1983 Japanese aircraft manufacturers are continuing work on the F-15 and the P-3C at levels that are slightly above last year but work on the fuselage of the Boeing 767 has diminished in line with the decline in orders from airlines. The industry is thus forecasting a very modest increase in production during the current fiscal year to perhaps Y460bn.

The Society of Japanese Aerospace Companies, which has been working for some time on a long range "vision" for the industry believes that a decision on the projected 150-seater civilian aircraft known in Japan as the YXX may be crucial to the industry's future in the mid-1980s. It does not believe, however, that either Japan or Boeing (the company expected to lead the project) will be ready to go ahead for at least another one to two years.

The YXX project is seen as a key to the future growth of the Japanese industry since it represents the main hope during the next few years of reducing the industry's dependence on defence orders. These currently account for just over 80 per cent of total production, despite continuing efforts by Japanese manufacturers to diversify into non-military production. Previous Japanese projects in the field of civil aircraft included the YS-11, a short haul 60-seat airliner of which 182 were produced from the mid-1960s onwards and the MU series of business aircraft manufactured by Mitsubishi Heavy Industries.

Mitsubishi has sold more than 700 MU-2s, a 10-seater turbo-prop aircraft, but suspended production temporarily last summer after a sharp fall in orders from the U.S. Production of the MU-300 business jet continues but Mitsubishi's order backlog had fallen sharply early this year from earlier levels. Mitsubishi is currently producing between two and four MU-300s per month from its Nagoyo aircraft workers, and reports an order backlog of 37 aircraft. Overall operations at Nagoyo could decline by 20 to 30 per cent over the next four years according to Mitsubishi if no major new aircraft development materialises.

Although some 30 companies are covered in statistics collected by the Society of Japanese Aerospace Companies, the industry is dominated, on the mainframe manufacturing side, by just four: Mitsubishi Heavy Industries, Kawasaki Heavy Industries, Fuji Heavy Industries and Shin Meiwa.

With the exception of Shin Meiwa, which is dependent on its aircraft division for 18 per cent of its sales, none of the four is predominantly a manufacturer of aircraft. Apart from their role as airframe makers Mitsubishi and Kawasaki double as aero-engine manufacturers, while a third major heavy industry company, Ishikawajima-Harima, is also involved in engines.

All three of Japan's top aero-engine manufacturers participated in talks with Rolls-Royce on the projected XJ-500 engine which began in 1980. Early this year Japan agreed to participate in a wider version of the XJ-500 project in which Pratt and Whitney of the U.S. will be involved with Rolls-Royce along with engine manufacturers from Italy and West Germany.

Japan will bear a 23 per cent share of the costs of the re-planned project. About half the Japanese contribution is expected to be provided in the form of a Government subsidy.

On its present scale the Japanese aircraft industry is very far from being one of the mainstream industries — comparable with say cars, or electronics that support Japan's economy. The Ministry of International Trade industry sees aircraft as a future source of growth. But MITI's attempts to boost the industry have achieved modest results in the past and it seems clear that the real breakthrough in aircraft production is yet to come.

Charles Smith

STOL project on time

Spain

THE CURRENT year is something of a milestone year for Construcciones Aeronauticas SA (CASA), one of the smaller European aerospace companies, but the virtual sole representative of the sector in Spain.

An upgraded version of its remarkable successful short take-off and landing transport aircraft, the C-212 Aviocar, is due to roll out on schedule in early September and will make its maiden flight the following month.

This new aircraft, called the CN-235, is the result of a productive 50-50 relationship between CASA and the Indonesian aerospace company, P.T. Nurtanio. CASA marketing executives talk of a potential market for the CN-235 of 1,800 civilian units and a further 600 for military use.

The new aircraft will be seeking to make its mark in a new area for the industry, taking on competition from De Havilland Canada's Dash Seven and Saab-Fairchild's SF-340 in the growing commuter/utility aircraft category.

The CN-235, which is being built in both countries, is the offspring of the C-212 Aviocar. CASA, together with Nurtanio, has built on the marketing, design and mission knowledge acquired through the development of the sturdy, all-purpose Aviocar, an aircraft better known as "The Jeep with Wings." The two manufacturers are also counting on customers' loyalty to promote the sleeker CN-235, which is effectively a Range-Rover to the C-212 Jeep, and there are already firm orders for 84 aircraft from Indonesia and a further 20 from Spain.

Battle

CASA's standard bearer, and that of the industry in Spain, however, remains for the present the C-212. Some 241 Aviocars are currently operational, according to CASA, and a total of 339 have been sold. The 1983 sales thrust is immersed in a battle to gain a major 200 STOL aircraft contract from India. The Indian decision has been delayed for more than a year and the C-212's main rival for the order is the Dornier 228.

A second important contract looming for the Aviocar could come from the U.S. Air Force, which plans to buy a total of 18 light transport aircraft — two this year — to distribute spare parts and engines in Europe. A toe-hold in the USAF's European Distribution System Aircraft (EDSA) programme would be a crucial sales breakthrough for CASA.

The SAR version is held up by CASA as yet another example of the multiple-role adaptability of the C-212. Its civilian version can carry up to 28 passengers or loads of 2.8 tons (the CN-235 is designed to transport a maximum of 40 passengers using the more powerful GE CT7-7 engines against the Aviocar's Garret TPE-331).

A particular sales pitch for C-212 is its various military roles which allow it to switch from transporting patrols to ferrying casualties as a hospital aircraft, and from carrying vehicles to becoming an airborne command post or photographic mapping aircraft.

Last year was a good year as well for CASA's third major product, the C-101 basic advanced jet trainer. So far, according to CASA, over 100 C-101s have been sold and 70 delivered. A breakthrough last year was the sale of the trainer to two Latin American countries, ending the monopoly of the product by the Spanish Air Force.

CASA's sales staff are hoping for contracts this year from Singapore for a revamped C-101 that incorporates missile pods, and there are hopes of sales to Thailand and the Philippines, as well as to Indonesia.

While Spain's aerospace industry, founded and rooted on CASA, in which the State holding company, INI, has a 69 per cent stake, is confident of its product line, there is an air of uncertainty over the future of its maintenance and repair division, and whatever may lie ahead in the field of technological co-operation.

This depends almost exclusively on the final decision by the Spanish Defence Ministry on its choice for a new combat aircraft for the 1980s and 1990s. Last year, 84 McDonnell Douglas F/A-18s were ordered by the then Centre Government, and a letter of intent was signed in December. However, the new Socialist Government delayed the final contract in order to take another look at Panavia's Tornado fighter.

The poker game for the final contract has in practice meant at least the possibility of greater technological transfer to the national aerospace industry. Panavia's late bids have included a place for Spain in the consortium with Britain, West Germany and Italy. McDonnell Douglas, in turn, has been forced to increase its offers of local production.

Decision

Whatever the final decision—and there must be one by the end of May—CASA stands to gain. The original $3bn order for the F-18As (the combat aircraft preferred by the Air Force) had the company quietly critical over the spin-offs. The re-entry of Panavia into the bidding and the strong line taken by the Socialist Administration on the transfers, has created an atmosphere of expectancy among CASA executives.

The Spanish Defence Ministry is also due this year to decide on an ambitious missile programme in which CASA will be intimately involved. The choice is at present between the UK Rapier, the U.S. Chaparral and the French Roland and, as in the case of the fighter contract, the competition is in Spain's interest. The entry by CASA into the missile sector will prove a valuable diversification.

Tom Burns

Successful start for Hellenic venture

Greece

GREECE'S $500m investment in high technology, Hellenic Aerospace Industry, is looking for a substantial boost from pending Government procurement contracts for the purchase of new fighter and trainer aircraft for the Greek Air Force.

But already, in less than four years of operation, it has more than doubled its workforce and raised its foreign exchange contribution to Greece's balance of payments to $130m in 1982, with 70 per cent represented by savings of *currency outflows* and the balance deriving from the sale of products and services to customers abroad. This year, it is forecasting a sales turnover up 20 per cent, as close on $160m.

HAI came into operation gradually during 1979, in advance of a formal opening in December of that year. It is situated at Tanagra, 60 kms from Athens, on a site adjacent to an ancient Greek cemetery and a modern Air Force base.

Its objectives when it started were to give Greece national defence self-sufficiency in the aviation field, and then to carve out a niche in the world market. The former has already largely been attained, in terms of overhaul and maintenance work for the Greek Air Force and the Army and Navy aviation services, permitting attention to be concentrated now on expansion of manufacturing activities.

Manufacturing as a proportion of total operations has already been raised from zero in 1979 to between 30 and 35 per cent now, with management confident that the figure will go above 50 per cent in the next five years.

Much will depend on the offset and buy-back arrangements to be stipulated in the Government contract for new fighter aircraft, and the degree of construction to be involved in the planned new trainer aircraft programme.

Competitors

Greece is seeking advanced combat aircraft from the late 1980s onwards. The number involved has not been disclosed, but is expected initially to be about 60. Competing for the order are Panavia, the British-West German-Italian consortium building the Tornado multi-role combat aircraft; McDonnell Douglas of the U.S. with its F-A-18 Hornet, the U.S. General Dynamics group with its F-16 and the French Dassault Mirage 2000. A decision is expected later this year.

In return for placing the order, the Greek Government wants offset arrangements covering not only participation in the manufacture of the aircraft, but also a substantial share of other aerospace and missile business, and assistance with industrial activities of particular interest to the Greek economy.

Discussing the two programmes, HAI's marketing director Mr Dennys Leonidis-Plessas, said the company expected a reasonably high Greek value added factor for the fighter aircraft and also would be producing buy-back components for the supplier. As regards the trainer aircraft, HAI would be the production platform for manufacture of the type selected. "The international tendering aims not at the purchase of ready aircraft but at buying manufacturing and design drawings and having the airframe produced and assembled here in Greece," he said.

The Greek Air Force has made a preliminary request for 51 trainer aircraft, but HAI expects this figure to double over the first five years—apart from anticipated orders by the Army and Navy, possible other applications that the aircraft may have in Greece, and manufacture under licence for export.

Readiness

When HAI was set up, Mr Plessas said, there were three basic goals:

1. To increase the operational readiness, technical autonomy and support self-sufficiency of the Greek Air Force and the aviation sections of the army and navy;

2. To save foreign exchange and increase currency inflows ("We have reached the point where virtually no single component has to be sent outside Greece for overhaul by the Air Force or the aviation groups of the navy and army, while we have carried out maintenance on 24 different aircraft types"); and

3. To create an industry that would become a pole of attraction for technology and knowhow that could be made available to other sectors of the Greek economy.

"Today HAI is really a complex of five different factories, one for aircraft, one for accessories, one for electronics, one for engines and one for manufacturing." Mr Plessas said. "It is a very good example of how a country like Greece, which is not industrialised to the Western European extent, can acquire needed technology, train a local workforce, and install modern management techniques."

Concentration on manufacturing developed gradually, out of a realisation that there was no other route to financial viability. Most of the manufacturing is one sub-contractor basis for aircraft companies abroad.

HAI now has manufacturing contracts with Aeritalia for control surfaces, floor panels and lower lobes of the Italian G-222 transport aircraft, with Agusta for the complete cabins of an initial 77 A-109 helicopters, with Aerospatiale of France for Airbus door frames assembly and manufacture, with Dassault in connection with the Mirage F-1, with Snecma for engine parts, with Thompson-CSF for electronic components, with Canadair of Canada for spares for the CL-215 fire-fighting aircraft, and with Contraves of Italy in connection with a short-range air defence system.

Collaboration has also been strengthened with Greek military research establishments. One result of this is a programme for the design and production of military *telephone* switchboards for the ground communications needs of the Greek Army, and a basic contract now under negotiation for the modernisation of the Greek armed forces ground communications system.

In the same area, HAI is participating in a number of international programmes inside and outside Nato. These include the Hermes communications, *command and control system for the* Greek military; the European Stinger missile; maintenance and overhaul of the Sidewinder missile, and repair of the engines used in AWACS aircraft. Three major contracts with the U.S. Air Force relate to maintenance and overhaul of the J-79 engine, and electronic accessories and aircraft components.

"The growth has been dramatic, and has required very rapid learning by a workforce the average age of which is only 33," Mr Plessas says. "We managed to set a faster pace than we had expected originally because we were able to attract a large number of Greeks who were working abroad but wanted to return to their own country—*there's a lot of talent of this* kind spread all over the world."

This in turn has facilitated a programme of "Hellenisation," to the point that the foreign component of the workforce has been cut from an original 15 per cent of 1,500 to a present two per cent of 3,400.

Though wholly-owned by the Greek State and run from the beginning by a nine-member Greek board of directors, HAI was set up largely with foreign expertise. Lockheed Aircraft Services handled systems and equipment requirements, Lockheed Aircraft International was *responsible for management and* control. General Electric of the U.S. undertook the design and commissioning of the engine maintenance and overhaul facility, Westinghouse Electric Corporation handled electronics and avionics equipment installations, and construction design and site supervision was the responsibility of the Austin Company of the U.S.

Renewal

Only Lockheed is still intimately concerned with operations, under a contract *due for expiry or renewal at* the end of this year. While no decision has yet been taken on whether to continue the relationship in its present or in some amended form, HAI is now moving in the direction of flexible sophisticated short-term contracts with companies providing the experience needed at a particular time. The Lockheed connection will be re-examined through this prism over the next few months.

HAI identifies its main growth area as the military sector, with good prospects for contracts from countries of the Middle East and North Africa. Two support contracts already obtained in this area involve the Egyptian C-130 Hercules fleet and the engines of Jordanian Mirage aircraft. HAI says it never counted much on work from Olympic Airways, which has its own maintenance department, though it is close to signing a support agreement for Olympic's engines now sent *overseas for maintenance.*

Training, too, is becoming a "profit centre," with sales of this form of service to a number of Mediterranean countries. HAI has training contracts with the Air Forces of Lebanon, Bahrain, and the United Arab Emirates (UAE).

Victor Walker

Aeroflot, a state monopoly, is by far the biggest airline carrier in the world

Fuel efficiency emphasis

Soviet Union

TO SQUEEZE greater efficiency out of aircraft by developing less thirsty engines and longer-range versions of existing models is now one of the top priorities of the Soviet aircraft industry and *Aeroflot*, the Soviet airline.

Two new aircraft, the Ilyushin Il-86 airbus and the Yak-42 *intermediate range tri-jet*, are in serial production and steadily being introduced on new domestic and international routes. But new long-range and cargo versions of the Tupolev Tu-154 tri-jet have also been introduced this year.

The long-range Tu-154M is claimed to be 20 per cent more fuel-efficient than standard models and can fly up to 5,000kms without refuelling. At the same time the Tu-154's all-cargo version with a 20-ton cargo capacity and a 3m-wide side loading hatch has now also been introduced on domestic *flights. The cargo door has* been designed to facilitate direct loading of standard containers both from ordinary trucks and truck-mounted cranes.

Freight is big business for Aeroflot, which carried more than 30m tons during the last five-year plan and will carry more than 33m tons during the current plan. Capacity has been greatly increased by introduction of the Ilyushin Il-76, 40-ton freighter which is especially useful for airlifting bulky equipment and heavy arms. The Il-76 has proved a successful model in export markets—particularly in the Middle East with buyers such as Libya and Iraq who are also big Soviet arms purchasers.

But Aeroflot still has a long way to go before it comes near to matching the operational efficiency and standards of service offered by Western airlines. The number of aircraft operated by Aeroflot is a secret. This is not surprising because Aeroflot, like so many Soviet institutions, is a para-military organisation.

Monopoly

It is also a monopoly. Anything which flies in the Soviet Union is flown either by the military or by Aeroflot. Thus the estimated 3,500 aircraft of various types in the Aeroflot fleet range from light single-engined crop sprayers through helicopters to the airbus.

There are no figures available for average aircraft utilisation rates but at Soviet airports a very high number of aircraft are to be seen standing parked *on the ground at any* one time.

Relatively low apparent utilisation rates are partially compensated for, however, by the fact that Soviet citizens are inveterate aircraft travellers and most internal flights are regularly fully booked. Indeed, *many flights are overbooked.*

Domestic fares are still low by international standards.

Over the current five-year plan, Aeroflot expects to carry nearly 550m passengers, which makes it by far the biggest air carrier in the world. It is the epitome of the "no frills airline." On flights of less than 3½ hours passengers are lucky to get a boiled sweet or a cup of tea. Beyond that they can look forward to stewed chicken.

In many ways Aeroflot is at its best serving the remote pioneer areas of the Soviet Union, and there are plenty of those. A whole stable of rugged, sturdy take-off and landing aircraft have been developed by the Antonov and Yakovlev design studios in particular. Helicopters are also used extensively for lifting heavy or bulky equipment into drilling camps or construction sites in trackless tundra and permafrost.

Often the aircraft or helicopter is the only way to fly in workers and supplies to remote areas. Likewise in remote areas of Yakutia, for example, Aeroflot aircraft fly out diamonds and gold as well as valuable ores like tin which otherwise would be virtually untransportable.

Soviet aircraft designers are very excited about the prospects for non-conventional aircraft—especially *hovercraft and airships*. Despite the obvious advantages of such craft in a country with vast expanses of permafrost, marshland and tundra, the development of such craft is facing bureaucratic obstacles and industrial conservatism.

This led to a dramatic "cri de coeur" *from the* Russian daily newspaper, Sovietskaya Rossiya, last February. The Soviet Union, it said, is lagging *far behind* the U.S. and other Western countries in developing the airship and claimed that government ministries had ignored requests for support from institutes and academic groups trying to put an experimental craft into service.

No such problems appear to daunt the military side of the industry where new and updated fighters, bombers and cargo aircraft roll off the assembly lines like blini (Russian pancakes). According to American military publications, a major effort is now going into the development of a Soviet *strategic bomber similar to the* U.S. Rockwell B-1B. The Soviets for their part are showing considerable apprehension about U.S. "stealth" technology and about the "Star Wars" space conflict scenario outlined by President Reagan before Easter.

The Soviet aerospace industry *also casts envious eyes over the* U.S. Space Shuttle while its own steady development of manned space laboratories received an untimely disappointment in April when the Soyuz T-8 manned capsule failed to dock with the orbiting station on Lenin's birthday as planned and had to be brought back to earth.

Anthony Robinson

Leading an industrial revolution

Singapore

SINGAPORE'S aerospace industry may be relatively modest by world standards, but its performance has pleased both the multinational companies which *have set up operations there* and the Government, which pinpointed aerospace as a key sector in its so-called industrial revolution which began in the late 1970s.

From the Government's point of view, the industry has all the right ingredients: it is capital intensive, has high value added, offers potential for the transfer of technology and plugs Singapore into the worldwide aerospace system. The Government intends to turn Singapore into the most comprehensive repair centre in the region and to encourage companies to set up component manufacturing.

Several new companies started operations last year and others *expanded*, despite a downturn in demand from the United States, Singapore's largest market.

Fixed assets, mainly new investment, totalled S$2.45m in December 1982, up 70 per cent from the year before. Total output increased by 12.7 per cent, while the number of workers employed—3,500—was only marginally higher than in th eprevious year.

Some 22 *companies, including* leading names like Garrett, General Electric and Sundstrand Pacific, have made Singapore their regional headquarters.

The Government is very much in on the act, to compete alongside the multinationals. Singapore Airlines (SIA), owned by the Government through its holding company Temasek, has developed a large engineering facility to carry out the maintenance of its own very modern fleet, an electronics workshop repairs and services autoflight and navigation equipment.

SIA recently awarded a £5m contract to Britain's Rediffusion Simulation for a Boeing 747-300 series simulator, to train its own flight crews and those of other airlines.

Its engineering training department also trains technicians and engineers on programmes which run for between 18 months and five years.

The Government's other major holding company, Sheng-Li, which comes under the Ministry of Defence, has also set up, under the umbrella of Singapore Aircraft Industries, four companies which maintain, modify, repair and overhaul both civil and military aircraft, including the A-4 Skyhawk, Hunters, Strikemasters, Lockheed C-130 Hercules, Alouette III and Bell helicopters. SAI hopes to break into the international market by exhibiting at the forthcoming Paris Air *Show for the first time this* year.

The SAI group expects increased business this year amounting to growth of 18 per cent, from S$97m in 1982 to S$118m this year. The group is making a determined bid to capture military contracts.

One of its companies, Singapore Aerospace Maintenance Company (SAMCO) recently won a S$5.3m contract to overhaul eight American naval aircraft, its fourth such contract in the past three years.

Incentives

There is still room for the private sector and every encouragement has been given *to major foreign companies to* set up their regional operations in Singapore. Incentives include the exemption of the corporate tax rate of 40 per cent for the first five years of operation, or a concessionary tax rate of 4 per cent on company income derived from export sales. There *is* also an investment allowance which can be between 10 and 50 per cent and a capital assistance scheme under which projects can attract *long-term* loans at favourable rates.

The Economic Development Board, which has the responsibility for attracting foreign investment to Singapore, has set aside a site at Loyang, near the new Changi Airport, and is constructing new factories for companies which need to begin their commercial operations quickly. So far eight of the factories are ready, three of them with an area of 2,000 sq ft. About 14 more will soon be built.

Prospects for the industry were also improved by the signing of a bi-lateral airworthiness agreement between Singapore and the United States in August, 1981. This gave the Singapore Department of Civil Aviation the right to certify that a component complied with American laws and requirements and enables Singapore to manufacture parts and components for the United States without their having to be re-certified by the *American authorities.*

The Government remains optimistic that despite the worldwide turndown in the aerospace industry, Singapore will continue to grow, albeit at a slower pace. Growth in 1983 is projected at around 10 per cent, lower than for the past few years, but still higher than Singapore's overall growth rate which, officials believe, will be between 5 and 7 per cent.

Singapore's long-term objectives remain the development of the repairing and overhauling aspects of the industry, using Singapore's attractions as an ideal distribution point. Most companies appear to share the view that although times may not be as good in the immediate future, Singapore is poised to take advantage of the upturn in the industry when recovery begins, hopefully in 1984.

Kathryn Davies

Domestic civil market limited

India

INDIA'S AIRCRAFT manufacturing programme is limited to military aircraft although Hindusthan Aeronautics makes a small trainer called the Pushpak *which it has designed itself.* The domestic market for civil aircraft is too limited for an indigenous manufacturing programme and there are no plans for export, although Hindusthan Aeronautics is trying to sell the "Kiran" jet fighter to countries such as Malaysia for anti-insurgency operations.

The company abandoned plans to manufacture the Jaguar under licence from British Aerospace following the *Indian* Government's recent decision to limit the number of these aircraft for the Indian Air Force to 120. Of these 45 are being imported in flyaway condition and the rest are to be imported as CKD kits for asembly by Hindusthan Aeronautics at its Bangalore plant.

Its expansion plans depend on the Government's decision on future fighters for the air force. The focus will be on the MiG-27 which is to be built at three plants at Bangalore, Nasik and Koraput—originally established to manufacture the MiG-21—and which have just completed making its advanced version, the MiG-21 Bis. The Government has decided to buy MiG-23s and MiG-25s from the Soviet Union and go straight to manufacturing the MiG-27, the most sophisticated in the series.

The most probable Western collaboration will be with Marcel Dassault of France from which the Government has already ordered 40 of the sophisticated Mirage 2000 fighter, only the prototypes of which have been flown. An option for rights to manufacture the *Mirage 2000 under* licence has been taken and a decision will be taken on this in the next year or two.

On the civil side, India has three airlines, all of them Government-owned. All use imported aircraft, Air India, the international airline, operates a worldwide service based in Bombay with Boeing 707 and 747 aircraft. It is now planning modernisation, beginning with *the phasing out of its aging* Boeing 707s and, over a longer period, the 747s. A number of aircraft are being studied but no decision has been taken and is not likely to be taken for some time.

Expectations

The domestic Indian Airlines (with services also to Pakistan, Nepal, Bangladesh, Sri Lanka and the Maldives) uses the Airbus and Boeing 737, and a few Avro 748s manufactured until recently by HA at its plant at Kanpur, Uttar Pradesh. The *third airline, Vayudoot, operates* Avros borrowed from Indian Airlines in regional services connecting small towns and is planning to buy its own short-haul aircraft.

Vayudoot, which operates low-profit routes, has still to get going but both Air-India and Indian Airlines have done remarkably well at a time when most of the world's airlines are showing losses Air-India estimates it will make a net profit of Rupees 360m in 1982-83. More than twice is expectations of Rupees 176m when the financial year started.

Indian Airlines estimates it has made a net profit of Rs137m ($13.6m) in 1982-83 and hopes to increase this to Rs212 in 1983-84 when it expects to have an operating revenue of Rs5.2bn.

Indian Airlines has a virtual monopoly of the country's domestic routes — Vayudoot limits its services to small uneconomic routes—and this *explains* its profits. Air-India competes with the world's airlines and its performance reflects remarkable management successes despite high fuel costs.

In aero-engines, work is in progress on the GTX, a highly-efficient gas turbine engine *developed* by Hindusthan Aeronautics research wing. It has been selected by the Government for manufacture of a fighter but the design of the air frame has not yet been chosen.

The company is trying to design its own airframe but is also negotiating with British Aerospace. There are *also* plans for the manufacture of what is called a light combat fighter and it is possible that the GTX-*based aircraft*, possibly with a second generation engine, will be chosen for the programme. Talks are being held with British Aerospace on this also but the proposal is still tentative.

India's $1bn 10-year space programme got a much-needed boost when the 23-metre-high satellite launch vehicle SLV-3 zoomed into space from the spindle-shaped backwater island of Shiharikota in Andhra State last April to put the third 41.5 kg Robini satellite into orbit.

Just a year ago, the programme *had been badly* jolted by the unexpected failure of the Insat-1—a spacecraft designed to open new vistas in national long-distance telecommunications, mass communications and meteorology services using space technology.

The spacecraft stayed aloft just five months before being de-activated following moon interference with its earth sensor and a series of complications that followed. A major review has shown that Indian space scientists had developed a basically sound design. A strategy is now being followed for *the indigenous design* and development of a second and subsequent Insat satellite.

India's space programme *made a modest beginning* in 1963 at the Thumba equatorial rocket launching station near Trivandrum in Kerala State, this soon proved inadequate and the Shiharikota range—shortened to SHAR, or an arrow—is now the most extensive establishment of the Indian Space Research *Organisation* (ISRO). Research and technology development remains concentrated at the Vikram Sarabhhai Space Centre at Trivandrum.

The new series of Insat-II test satellites should get under way early next year. In the meantime, the second Insat-I spacecraft is to be launched by the eighth flight of the U.S. Space Shuttle in the autumn. With this, and the flights planned this year, the space programme should be back on course.

K. K. Sharma

Airlines struggle with big losses

The fear is that if fuel costs do decline significantly, government pressures to reduce fares may be increased just when a breathing space is needed.

THE WORLD'S airlines are still passing through the worst recession in their history. Losses incurred by the air transport industry as a whole during 1982 amounted to about $2bn, bringing total losses for the period from 1977 to $5.7bn, with further substantial losses forecast for the current year of over $2.1bn. For 1984 there is a lower forecast of $1.4bn losses.

Although there are signs of an upturn in the world economic situation, and many in the airline industry are hoping that this will start to be reflected in its results later this year, it is likely to be some considerable time before the industry can pay off the overall losses of more than $9bn that will have accumulated between 1979 and the end of 1984.

Most of the losses already incurred or in prospect stem from the very high interest payments on loans for new equipment taken out by the airlines over the past few years, both to replace ageing fleets and to meet an anticipated growth that in the event has not occurred.

The airlines' difficult financial situation has also been compounded by a number of other major problems, apart from slack or zero traffic growth (leading to over-capacity on many air routes with too many seats available for too few passengers), high interest rates and high inflation.

These factors include the blocked or delayed transfer from some countries, especially in Africa, of airlines' earnings in those areas, which now amount to an estimated $1bn.

Another has been tardiness on the part of governments to sanction fares rises to enable the airlines to recoup on rising costs, especially fuel costs. In some cases there has been severe pressure by some governments on airlines to actually reduce fares to meet consumers' demands for cheaper air travel.

The current decline in crude oil prices is already resulting in a stabilisation of aviation fuel prices, and many in the airline industry hope that a period of declining aviation fuel costs may now be in the offing, although it is recognised that this may not be of very great magnitude, or last very long—the overall long-term trend in fuel prices being likely to continue upwards.

The fear though is that if fuel costs do decline significantly, government pressures on the airlines to reduce their fares may be increased commensurately, at a time when the industry needs a breathing space to allow it to catch up with and redress its heavy losses. The airline industry argues that fare levels still lag perhaps as much as $1bn behind the rises in fares needed to offset past rises in fuel costs alone.

But there are some other problems that have been largely of the airlines' own making. One is the practice known as "discounting" — offering air tickets at prices well below the officially prevailing rates agreed either in inter-governmental negotiations or through the normal fares-fixing machinery of the International Air Transport Association itself.

One estimate has put the cost of discounting to the airline industry at over $1bn a year—revenues that should have accrued to the industry but which are totally lost.

Monitoring

While strong efforts are now being made to stamp out this practice—by means of a tighter policing of their own activities by the airlines themselves through the IATA's own "Fare Deal Monitoring Group"—progress is slow, and it may be some time before the industry can even reduce the practice to manageable proportions.

In many parts of the world, discounting has become almost a way of life for some airlines, and even their governments, and since many airlines are not members of the IATA, it is necessary to get governments themselves to agree to help stamp it out.

This is already proving extremely difficult although there have been some successes, especially in the Far East and Middle East, and the efforts are continuing.

If discounting, costing over $1bn a year, can be substantially cut down, if not eliminated, and if much of the $1bn of foreign earnings now blocked could be released, much of the industry's current financial problem could be eased.

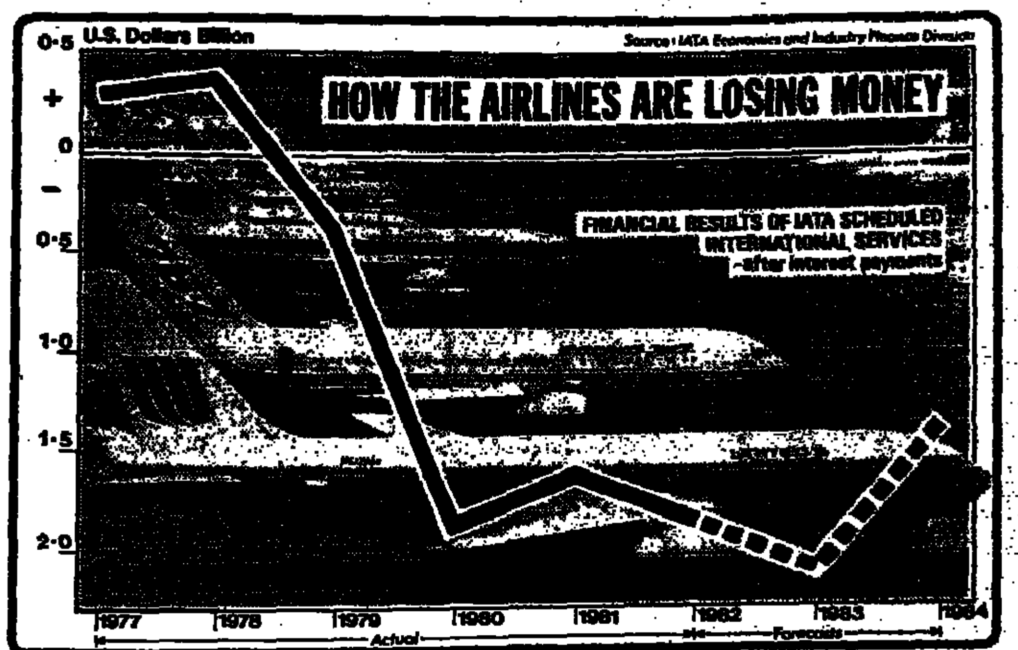
But there remain other difficulties which are likely to prove much more intractable. One is the industry's propensity in some parts of the world to indulge in "fares wars," which achieve little in the way of traffic growth but bleed the participating airlines dry—in some cases almost to death, as the bankruptcy of Braniff in the U.S. and Laker in the UK have demonstrated.

The present battles in the U.S. for traffic on virtually all air routes, as a result of deregulation which has removed government controls on fares policies and because of the volume of competition on the routes, have already resulted in losses of many hundreds of millions of dollars in 1982, with equally heavy losses likely in 1983.

On international air routes, government controls remain in force, and the fares battles tend to be smaller in scale, but their effects can be severely debilitating to the airlines' revenues and profits.

This has already been demonstrated on the North Atlantic. It is estimated that in 1982, with close to 50 airlines—both scheduled and charter—flying the North Atlantic between Western Europe and North America, cumulative losses amounted to more than $600m. There is not likely to be much improvement in the current year, with further fares cuts likely this summer, as new "cut price" airlines such as People Express are launched on to the route.

One reason for these fares battles is an almost desperate bid by many airlines to try to fill their available seats at any price, reflecting the problem of significant over-capacity that now exists. It has been estimated that, during 1982, there were over 8.3m empty seats on the North Atlantic, representing the equivalent of as many as 56 empty Jumbo jets flying daily on the route.



Inter-airline agreements on capacity controls are impossible on the North Atlantic, because of the U.S. anti-trust laws which prevent U.S. airlines from even discussing such matters. Any efforts to control capacity must be left to inter-government negotiations, but in the past there has been considerable reluctance on the part of the U.S. Government to engage in such discussions.

One further problem already arising from all these factors is that the airlines are finding it difficult, if not impossible, to raise the cash they need to re-equip their fleets with new jets to replace their existing ageing and increasingly fuel inefficient fleets.

It has been estimated that the airlines are not likely to return to profitability until either 1984 or 1985 at the earliest, and that they will need to earn profits of well over $3bn in 1983 alone to meet actual (aircraft already ordered) or potential re-equipment costs. It seems likely, therefore, that even with the ending of the recession, the airlines will remain in a serious financial situation for a long time to come.

How, then, do the airlines, on the Atlantic routes and elsewhere, climb out of their difficulties? There are several methods, all of which are being tried in one form or another, but many of which could be pursued with considerably greater vigour than at present.

In the first place, the airlines themselves must continue to do all they can, with the aid of their governments, to halt the blood-letting of discounting air fares. They must also push their governments to do all they can to end the blocking of the transfers of legitimate earnings from foreign countries. Those two actions alone would do much to correct the current financial woes of the airline industry.

Beyond that, they must also seek to reduce the over-capacity that is wasting so much of the industry's strength. This is admittedly exceptionally difficult on some routes, such as the North Atlantic, but it is much easier elsewhere, especially in Western Europe, where extensive bilateral agreements govern much of the air transport operations.

But probably far more significant in the long-term is the need for most airlines to undertake the same kind of severe slimming operations that have been undertaken in the past two years or so by such airlines as British Airways and Pan American.

At the same time, many airlines still need to repolish their image to improve their punctuality, reliability and quality of service both in the air and on the ground. The long period of exceptional prosperity and extremely high annual rates of growth (10 to 12 per cent) of the pre-recession period undoubtedly generated in the world airline industry an atmosphere of complacency, which led to mounting criticism of the quality of service, while leaving the airlines highly vulnerable to the impact of the recession.

Shock

It is difficult to assess the degree of shock which the current recession, with all its problems, has given the industry as a whole, and to individual airlines, but it is clear to practically every air traveller that there is still much to be done.

Safety has never been compromised, and remains exceptionally high. But there is still the need for improved punctuality and reliability, for greater skill in ground handling (still the number one complaint world-wide for most air travellers), and a greater awareness on the part of governments and their agencies (such as Customs and Immigration, airports authorities and others), that air travel is no longer a luxury for the few, but a social, economic and even political necessity to modern life.

Michael Donne

Airport business expected to rise

Future developments in the densely-populated countries are likely to be expansions and adaptions of existing airports, bitterly debated by lobbyists and environmentalists.

UPWARDS OF $80bn is expected to be spent on airport ground facilities by the end of this century, to adapt airports, air traffic control and ancillary services such as fire services and other emergency services to cope with the anticipated volume of traffic that will follow the end of the recession.

The general belief is that the current annual total of 765m scheduled service air passengers worldwide will double by the early 1990s, if not before, and that throughout the 1990s, it is likely to double again.

This means that by the end of the century, well over 2bn scheduled service passengers a year will be travelling by air throughout the world, and that if the unmeasured number of non-scheduled passengers is also included, the figure could be as high as 3bn.

Finding ground-room for all these travellers is likely to pose some major difficulties for airports' authorities and governments worldwide.

One illustration of the problem is available in the current debate in the UK into whether or not a third major airport for London should be located at an expanded Stansted Airport, in Essex, or in a major extension of the facilities at the already saturated Heathrow Airport. Heathrow currently caters for close to 30m passengers a year, and is due to cope with up to 38m when the new Terminal Four, now under construction, is opened.

The argument lies between pushing Stansted up to an initial 15m passengers a year, with provision for further longer-term expansion to a possible maximum of 50m a year well into the next century, or looking at the shorter-term solution and building a fifth passenger terminal at Heathrow. This would lift capacity there from the 38m available when Terminal Four opens in 1985, to 53m by the later 1980s.

This highly-controversial problem is the subject of a public planning inquiry, now under way, which it is hoped will determine the vexed question of London's future airports pattern.

After that, the matter becomes a political affair, in the hands of the Secretary of State for the Environment, who is expected to settle the issue one way or another by early 1984.

In the meantime, work on building Terminal Four at Heathrow, to lift capacity at that airport to 38m passengers a year from the present 30m, and work on Terminal Two at Gatwick, south of London, to lift capacity there from the current 16m to 25m passengers a year, is now under way.

Both those developments, in their turn, were the subject of major public planning inquiries, bitterly contested by environmentalists, and decided only after much agonising consideration at government level.

The point which emerges is that in the densely-populated countries of the U.S. and Western Europe, Japan and some parts of South America, it is probably now virtually impossible to find any "greenfield" site for a new airport where none existed before.

Decisions

In those countries, all future airport developments are likely to be expansions or adaptations of existing airports, and even those will be the subject of bitterly-contested debate between environmentalists and air transport lobbyists, frequently solved only by direct government intervention, with decisions that probably will never entirely satisfy anyone.

In most of the emerging countries of the Third World, however, this kind of problem either does not exist, or has yet to develop into the major environmental issue that has been found in the industrialised and highly-developed countries. It is significant, therefore, that most of the estimated outlay of $80bn on new airport developments up to the end of this century is to be found in the Third World.

A recent list of major world airport projects prepared by the National Westminster Bank, detailing more than 30 major programmes worldwide involving outlays of more than $2bn, included only four outside the developing world, of which three were in the UK (one at Fife, one at Gatwick and one in the Docklands area of London), and one in the U.S.

The list did not include the possible development of either Stansted or a Terminal Five at Heathrow, because that is not yet settled. Nor did it mention the very large number of programmes now under way throughout the UK at provincial airports, where it is estimated that close to £200m is being spent over the next few years in improving up to 28 local-authority owned airports to cope with anticipated traffic expansion.

Indeed, it is probably impossible to list all the various airport development, improvement and expansion programmes now under way, for there is hardly an existing airport in the world at which some work is not going on to cope with traffic growth, either actual or potential.

Moreover, it is also almost impossible to list all the various places where new airport developments will become necessary in the years ahead, especially if the current economic recession ends soon, and air traffic resumes its pre-recession upward growth.

Because of the sums involved —Terminal Four at Heathrow is costing more than £170m, and Terminal Two at Gatwick over £150m, and these are small sums compared with those being spent on the new Riyadh and Jeddah airports in Saudi Arabia—the business of providing airports is intensely competitive. Not only are existing airport authorities—such as the British Airports Authority and the Paris and Frankfurt airport authorities—already involved in selling worldwide their expertise in designing, building and running airports, but also many major commercial groups are involved.

Engineering

In the UK, Plessey Airports, part of the Plessey group, the General Electric Company, International Aeradio and Cable and Wireless, are all involved in the provision of technical knowledge, and practical civil engineering and other facilities, for the development of airports in many parts of the world.

This is significant, because in many countries with a limited knowledge of air transport affairs, it is necessary to be able to provide a complete package system for aviation development, covering not only the entire design, development, financing and construction of a new civil airport, together with its operation at least for a limited time after its completion, but often also advice on the development and operation of the flag airline of the country concerned.

Thus, there has emerged the concept of a "package" or "turnkey" operation, with consortia of companies linked in one overall airport (and sometimes also airline) development concept, often resulting in close links with the country concerned for many years.

The value of these individual contracts is exceptionally high —in some cases running into several hundred million pounds —and as a result they are fiercely contested, while for the winning consortium the results often lead on to other business in the same country.

Even a £500m bill for the development of a major airport appear relatively cheap if all aspects of the work are taken into account, from basic civil engineering through to the provision of equipment and facilities for daily operation.

In all probability, IATA's estimate of $80bn is rather on the low side. To generate this cash will be a major problem for governments, airport authorities and the air transport industry overall through the rest of this century, and it seems likely that much of it eventually will have to be paid for by the passenger, through levies on ticket sales.

M. D.

Military demand remains strong

Although cash is tight, defence budgets are tending to rise and the emphasis is on conventional weapons and tactical aircraft.

THE STRENGTH of the world's military aircraft markets remains a dominant factor in aerospace manufacturing. Although the recession has bitten deeply into civil airliner production, with a marked diminution in the inflow of new orders, activity in the military aircraft and missile sectors has remained very high, with strong demand world-wide for combat aircraft, especially of the smaller, tactical types.

In many cases, where aerospace manufacturers are engaged in both military and commercial aircraft manufacture, the profits earned on the military side are sustaining the commercial divisions and helping them survive during the recession.

All the indications are that spending on military aircraft will continue at a high level through the 1980s. In 1980, the spending world-wide on military aircraft was about $25bn a year (excluding the Soviet Bloc and China, for which figures are not available). By 1985 (measured in 1981 prices) this figure is expected to have risen to $27bn a year, and will rise further to about $30bn annually by 1990.

By the end of this century, spending is expected still to be running at a rate of about $35bn a year, and will continue to rise thereafter.

There are several reasons for this rising trend in military aircraft sales. One is the continuing world political instability, generating an increasing desire by emerging countries in the Third World progressively to equip themselves with modern defence equipment, in which combat aircraft of all kinds, but especially of the cheaper, lighter tactical type, figure largely.

Another is the continued programme of improvement in military aviation potential now being undertaken by all of the major powers, including all the countries of Nato and others, which is generating a continuing demand for new technology across the entire spectrum of aerospace.

Defence budgets are tending to rise, with the emphasis on conventional weapons and military aircraft are a major factor in that increased spending. At the same time, however, cash is still tight, and there are considerable pressures on the aircraft designers and builders to produce ever-better value for money, with new materials and new technological advances being extensively exploited in the bid to improve combat performance with a minimum escalation in cost.

Urgent

Moreover, in some air forces, there is an increasingly urgent need to replace some ageing combat aircraft types which have served well for close to 20 years, but which are now being rapidly overtaken by technological advances and the improvement in the potential enemy's own capabilities.

This is generating in turn a concentration on the design of new types of aircraft that may not be in service until either the late 1980s or early 1990s, but which will be available thereafter through into the next century.

While much can be done by improving existing types of aircrafts, there inevitably comes a time when derivatives are no longer suitable, and a quantum leap forward into an entirely new generation of aircraft is not just desirable but essential.

This is particularly the case in the UK, where there is now considerable effort on the development of a new "Experimental Combat Aircraft" or ECA, which it is hoped will lead eventually to the full-scale development and production of a major new aircraft, the Agile Combat Aircraft or ACA—which could replace ageing Jaguar jets in the RAF in the late 1980s or early 1990s.

In recent weeks, there have been intensive discussions between the Ministry of Defence and the UK aerospace industry (British Aerospace, Rolls-Royce, Marconi Avionics, Smiths Industries, Dowty Group, Ferranti and Lucas Aerospace, among others) with a view to signing a contract for the development of the ECA as a "technology demonstrator," leading, it is hoped, eventually to the development and full-scale production of the ACA itself.

The Government's contribution is expected to be between £60m and £70m, but industry has already contributed more than £25m of its own money and will contribute very much more.

The technology demonstrator aircraft (as with the eventual ACA) is intended to be a twin-engined combat fighter, designed to fly in 1986, and will use a great deal of advanced technology, especially in carbon fibre and other new composite materials. It will also incorporate advanced techniques such as "fly-by-wire" controls, electronic cockpit displays and other developments.

It is intended that the overall airframe structure will be 15 per cent lighter than conventional fighter structures because of the use of these advanced materials.

Collaboration

The big problem in this venture is deciding upon European collaboration. British Aerospace has been involved in discussions with Messerschmitt-Bolkow-Blohm of West Germany and Aeritalia of Italy (its partners in the Tornado multi-role combat aircraft), while the French have also been sounded on the venture.

It is recognised that there is likely to be room for only one major new European combat aircraft type in the late 1980s and beyond, so the coming months are likely to be critical in settling the ultimate international collaborative arrangements on the venture.

British Aerospace believes that during the rest of this century there could be a world market for between 2,500 and 3,000 medium- to high-performance aircraft, to replace Phantoms, Jaguars and other combat aircraft. Of these, perhaps as many as 800 to 900 could be Agile Combat Aircraft, of which in turn about one third could be exported.

This is probably a conservative figure, since all of the 2,500-3,000 medium- to high-performance jets are potential ACA aircraft, and much depends upon the extent of the competition—especially if there are two aircraft in Europe, the ACA as a UK-German-Italian venture and the French ACX.

The prospect of France joining in any joint European venture for a new combat aircraft for the 1990s seems remote. The French Defence Minister earlier this year told the National Assembly that work on an all-French Experimental Combat Aircraft (called ACX—Avion de Combat Experimental — in France) was being pushed ahead, with the aim of developing from it an aircraft for quantity production by 1990.

The prime contractor for that venture is Avions Marcel Dassault-Breguet Aviation, drawing heavily on its experience with the Mirage 2000 and 4000 fighter aircraft. The maiden flight of the prototype ACX is expected in late 1985 or early 1986.

In the meantime, in the UK work continues on both the Jaguar jet strike-trainer fighter, and on the bigger Tornado multi-role combat aircraft. With orders for 572 Jaguars to date, of which over 460 have been delivered, work is currently in hand to meet the remaining requirement for components for Jaguars to be assembled in India, and on production for Oman and an undisclosed overseas customer. With other orders now in negotiation, Jaguar production is assured until 1986 at least.

With firm orders placed for 647 Tornado jets, out of the 805 planned, so far just over 200 have been delivered, including over 100 to the RAF, 81 to the West German Air Force and Navy and 19 to the Italian Air Force.

Included in those ordered to date are 70 of the more advanced Air Defence Variant (ADV) especially for the RAF. At current levels of production of about 110 aircraft a year in the three participating countries (the UK, West Germany and Italy), the Tornado programme will come to an end in 1989, unless export orders or additional air force orders in West Europe emerge.

Also in the UK, the RAF is now studying plans for a new basic trainer to replace its ageing Jet Provosts, and an Air Staff Target setting out the requirement is expected to be issued soon. British Aerospace will be bidding with its P-164 design, but Fairchild of the U.S. will also be in the fight with its T-64A, now under development as the U.S. Air Force's next generation trainer.

Some turbo-prop trainer manufacturers will be bidding also, including Beech of the U.S. with the T-34C, Embraer of Brazil with the Tucano, Pilatus of Switzerland with the PC-7, Siai-Marchetti of Italy with the SF-260TP, NDN Aircraft of the Isle of Wight with the Turbo-Firecracker and the West German RFB with its Fantrainer.

The second prototype of Northrop's F-20 Tigershark. On schedule for a first flight this autumn, it is being assembled with significantly fewer man-hours than the first aircraft

Emphasis

In the U.S., considerable design emphasis is now being placed on new combat aircraft for service in the 1990s. McDonnell Douglas, which is now building the AV-8B Harrier II vertical take-off aircraft for the U.S. Marine Corps (and for the RAF), in conjunction with British Aerospace, is now also designing a single-engined vertical and short take-off and landing aircraft that could become the first V/STOL aircraft to fly at supersonic speeds.

In the meantime work on building the AV-8B continues steadily. Four full-scale development aircraft are already being flight-tested at the Naval Air Test Centre, Patuxent River, Maryland, and Edwards Air Force Base, California, and McDonnell Douglas is now building 12 pilot production AV-8Bs at St Louis. The U.S. Marine Corps plans to take delivery of the first of those in the coming autumn.

Full-scale production calls for up to 336 aircraft for the U.S. Marine Corps, with 60 aircraft (called GR Mark Vs) for the RAF. British Aerospace and Rolls-Royce (in conjunction with Pratt & Whitney) are associated with McDonnell Douglas on the AV-8B venture, as well as on the new supersonic V/STOL design.

A number of other U.S. companies are working on new fighter concepts for the future. Grumman, a famous fighter builder, has been awarded a multi-million dollar contract to build two "forward swept wing" demonstrator aircraft, designated X-29A, the first of which is due to fly next February, at the company's Calverton, Long Island, test facility. The cash is coming from the Defence Advanced Research Projects Agency.

The object is to refine a design for a future generation of tactical combat aircraft that will be smaller, lighter in weight, and less costly, but more efficient than contemporary fighters.

General Dynamics, another major fighter builder whose current basic programme is the F-16 in various versions, is working on a private-venture advanced version of that aircraft, the F-16XL, incorporating new aerodynamic and systems technologies.

Northrop, another well-known fighter builder, has built its new F-5G tigershark, designed to be a comparatively low-cost fighter for export to countries of the Third World.

Also in the U.S. Rockwell International is developing the new B-1B long-range strategic multi-role swinging-wings supersonic bomber, under massive contracts already worth over $2bn. The B-1B, based on the original B-1 supersonic bomber of the late 1960s and early 1970, which never went into full production, will incorporate much advanced technology.

Two of the original B-1 prototypes are being used in the overall development programme, but the first new production B-1B is scheduled to fly late next year or early 1985, with delivery to the U.S. Air Force in 1985, and the total U.S.AF order of 100 aircraft expected to be completed by mid-1988.

Michael Donne

Importance of missiles grows

Over the decade to 1992, the world is expected to spend between $75bn to $100bn on tactical guided weapons.

THE DESIGN AND manufacture of guided weapons and missiles occupies a central place in the aerospace industries of the Western world and is set to grow in importance in military and commercial terms through the rest of the century.

The sector is important as a focus of some of the most advanced technologies available to any industry, using design skills in advanced micro-electronics, circuit design and in miniaturisation of control techniques.

Many of these advanced technologies are expensive and guided weapons manufacturers have developed internation co-operation and co-production arrangements to help offset the high costs. Several multi-million dollar programmes are in progress in Britain, France, Germany and the U.S. Other countries in Europe are also involved.

These collaborative programmes have helped to ensure the wide spread of guided weapons for defensive and offensive purposes through the armed forces of the nations involved. At the same time, long production runs have contributed to the reduction in unit cost and helped in the cause of standardisation of weapons in the North Atlantic Treaty Organisation.

In military terms, the importance of guided weapons is unquestioned. The Falklands war last year demonstrated how much contemporary armed forces depend on missiles for the rapid achievement of military objectives.

Both sides in the Falklands conflict achieved considerable successes with guided weapons—the British Aerospace Rapier anti-aircrfat missile bringing down many Argentine combat aircraft, while the Argentine Air Force, using the French-built Exocet air-to-surface missile, sank the guided missile destroyer Coventry, and the merchant ship Atlantic Conveyor. There has since been a marked upsurge in foreign military interest in both missiles, which is expected to lead to increased sales.

Accuracy

The rapid rate of advance in guided weapon technology in terms of accuracy, "electronic intelligence," miniaturisation and speed, has forced the designers of aircraft weapon platforms and land-based attack and defence systems to design their systems increasingly around the capabilities of guided weapons.

These are no longer mere appendages to the carrying system, but are themselves the raison d'etre for the weapon platforms.

The U.S. and other western countries with defence industries are expected to spend a total of $7.9bn on all types of tactical guided weapons and missiles in 1983.

Over the decade to 1992, a total of between $75bn and $100bn is expected to be spent by the U.S. and the rest of the world on tactical guided weapons, according to U.S. sources in estimates made last year. This scale of spending is similar to that expected to be spent by the U.S. alone on its strategic missiles programme over the same period.

Spending in the U.S. in the 1983-84 financial year alone on missiles of various types is planned to amount to several billion dollars, including $3.3bn on continued research development and procurement of the U.S. Air Force's MX strategic intercontinental ballistic missile, over $650m on further development and procurement of the USAF/General Dynamics ground-based Cruise missile, and over $400m on development and procurement of the General Dynamics' Tomahawk air-launched Cruise missile.

These figures place the guided weapons industry in almost the same league as the commercial airliner sector of the aerospace industry, with total sales of $126bn expected to be spent in the ten years to 1992.

British Aerospace's Rapier: value proven during the Falklands War

The volume of work on guided missile programmes is already considerable and much of the spending on new programmes into the 1990s is already being planned, either at the feasibility or project definition stage.

At the same time, a number of major projects that will provide work for Western aerospace companies in the interim are close to being finalised, with several decisions pending by defence departments, and work is continuing on the wide range of weapons and systems already in existence or nearing the full production stage.

In Europe and the U.S., much attention is focused on the proposed new generation of air-to-air missiles. These are to be developed and may be sold on a "two-way-street" basis between the Governments of Britain and Germany on one side and the U.S. on the other.

Two missile projects are involved. The two European countries are to develop an advanced short-range air-to-air missile (ASRAAM) and the U.S. is to develop a new advanced medium-range air-to-air missile (AMRAAM).

The programmes are complementary and are part of a planned rationalisation of future air-to-air missile design, development, production and procurement by the three governments. The aim is to share costs, avoid duplication of effort and provide a large common market for the missiles, with standardisation a crucial consideration.

The ASRAAM is being developed as a 50:50 joint venture by British Aerospace, as lead contractor in Britain and Bodenseewerk Geratechnik (BGT), the lead contractor in Germany.

The AMRAAM is being developed by the U.S. with Hughes as the lead contractor.

The proposed developments are based on memoranda, of understandings signed by the three governments. Under these agreements, the European partner and the U.S. will each have the right to produce both missiles, where appropriate under licence.

Britain and Germany are expected to buy the AMRAAM medium range missile from the the U.S. and in turn, the U.S. may buy the European ASRAAM short-range missile.

The U.S. has "called a halt" to further development of air-launched short-range agile defensive missiles beyond the current Sidewinder range to see if Europe, and in particular Britain and Germany in partnership, will be able to provide a missile over the next decade, Mr Hugh Metcalfe, the new chief executive of the British Aerospace Dynamics Group said earlier this month. He forecast that a "production line for the European design (ASRAAM) will be set up under licence."

France is also understood to be interested in taking part in the project, perhaps at a later stage.

British Aerospace is still at the feasibility study stage with the ASRAAM and no final solutions have been agreed, but BAe would prefer to opt for a completely new type of missile. This would be made possible by advances in miniaturisation and control techniques and involve the choice of hypersonic (many times the speed of sound) velocities in a "hittile" type of guided weapon. This would have little or no warhead and would destroy its aircraft target by actually hitting it.

BAe expects to start production of ASRAAM by the late 1980s with the missiles entering service before 1990.

However, the ASRAAM programme is currently being reviewed, although Mr Metcalfe said he hoped that "over the next few months the U.S. Government will accept that there is a way ahead with new technology, very high performance and low cost, and that they will back us all the way." ASRAAM would then become one of the major products in the air divison of BAe Dynamics.

Further developments in electronics and the military need for Nato aircraft to defeat anti-aircraft defences, have led to the development of new "anti-radiation" missiles. These are guided weapons designed to destroy enemy radar sites by beaming in on the radar emissions from the ground.

British Aerospace has proposed to the British Ministry of Defence its air-launched anti-radiation missile (ALARM), while Texas Instruments of the U.S., in partnership with Lucas Aerospace, has proposed its high-speed anti-radiation missile (HARM).

HARM exists, while ALARM is still at the development stage and is understood to be between nine months and a year behind HARM. Nevertheless, BAe claims that its ALARM weapon is a superior missile. It is smaller and is claimed to be only half the weight of HARM.

BAe has warned that if the British Government does not award it the contract, 700 staff will have to be made redundant, but if it does go ahead, 2,800 jobs in design and production will be secured over the 10-year period of the missile's design and production.

Export markets

ALARM would also possibly involve German manufacturers as well as Marconi in Britain, which is expected to build the seeker head for the missile.

BAe is likely to produce a minimum of 2,000 ALARM missiles with about 750 missiles going to the Royal Air Force. The rest would be sold to export markets in an attempt by BAe to win a share of the estimated world market for between 15,000 to 20,000 anti-radiation missiles. A great deal is at stake, for BAe and for the 13 other major British sub-contractors involved in the ALARM project.

In the field of ground-launched missiles, the Euromissile Dynamics Group (EMDG), formed by British Aerospace, Aerospatiale of France, and Messerschmidt Bolkow Blohm of Germany, is co-ordinating the development of a third generation of anti-tank missiles (Trigat). The group is now negotiating a project definition contract. This is expected to be awarded this summer.

This will be a medium-range laser beam riding missile to replace the Milan anti-tank missile from the early 1990s and a longer-range passive infrared homing missile to replace Hot and Swingfire missiles in the mid-1990s. A massive production run for these missiles is expected.

The second major land-based missile project getting under way in Europe and the U.S. is the Multiple Launch Rocket System (MLRS).

The first version of the MLRS is already in service with the U.S. forces. MLRS II is being developed by Vought for Germany, but is not in service. MLRS III is under consideration by competing consortia, led by General Dynamics and by Hughes respectively.

The Bracknell division of BAe Dynamics is in the General Dynamics team which also includes Sperry U.S., Dynamit Nobel of Germany, SEP of France and Britain's Scicon.

The Hughes team includes the Stevenage division of BAe Dynamics, Aerospatiale and MBB.

Lynton McLain

AEROSPACE XVI

Space technology expanding rapidly

Between now and the end of this century at least another 200 to 300 commercial satellites of various kinds will be put into Earth orbit.

WHILE A substantial part of the world aerospace industry has been suffering from the recession, one arena—that of space—has been expanding at a dramatic pace. Although the era of space technology is little more than 25 years old, it has evolved rapidly from the first Soviet Sputnik satellite of 1957 through to the highly complex manned reusable space transport system of today, NASA's Shuttle, that is capable of carrying into space and launching satellites on its own.

While military space development covers satellites for defence communications and other purposes, and is largely secret, civil and commercial space technology covers several broad fields in its own right: deep space probes that are designed to discover more about the solar system and about the Earth's space environment; scientific satellites that are intended to discover more about the near-Earth environment; and "applications satellites" that are intended to put space technology to work. Examples include telecommunications, weather forecasting, Earth resources monitoring and many other ways.

Activity in all these fields has been expanding. By the end of 1982, there were still more than 4,800 spacecraft of various types in orbit, of which about 4,750 were in Earth orbit, 16 were in orbit round the moon and 36 in solar or inter-planetary orbit.

Of these, in turn, the U.S. was responsible for about 2,780, and the Soviet Union for 1,815. Of course, many more spacecraft than these have been launched over the past 25 years or so, but many have either malfunctioned, or completed their duties and fallen silent, while still in space, or burned up on re-entering the Earth's atmosphere at the end of their missions.

The current average annual rate of spacecraft launches of all kinds runs to about 50 worldwide, if military spacecraft are included (the numbers are not clear, for many of such launches are never publicised), but the total of commercial spacecraft is much lower, although it is now expanding annually.

Most of the latter are satellites for communications (still the biggest single function for near-Earth satellites), followed by weather forecasting and Earth resources monitoring—a now rapidly expanding field in its own right.

It is estimated that between now and the end of this century, at least another 200 to 300 commercial satellites of various kinds will be put into Earth orbit—mostly for communications of one kind or another (including the new arena of "direct broadcasting satellites"), but also including many for Earth resources monitoring—at an estimated outlay of at least $6bn.

If the essential ground-based facilities for these satellites are also taken into account, the overall anticipated spending on commercial space activities through the next 17 years is likely to be more in the region of $20bn to $30bn.

Competitive

Space has thus already become big business, and is expected to become even bigger. At the same time, it is also becoming ever more fiercely competitive, as more and more companies in more and countries vie with each other for the business available in both the space and ground hardware.

Prospects for the increasing commercialisation of space have been considerably enhanced as a result of the development in the US of the manned, reusable Space Transport System (STS), generally known as the Shuttle.

The system is already beginning to show that in time, it will become an invaluable means of launching satellites of all kinds, and other payloads, into space, and will help consaiderably to bring closer the day of constructing manned space stations in permanent orbit round the Earth, with parts flown up by a series of Shuttle launches.

Already President Reagan has called for a study into the possible development of a permanently-based manned space station, which would help the U.S. to retain its lead in space activities. The study is expected to consider not only technological, but also the political, sociological and defence implications of such a manned station, together with detais of costs of development and maintenance and whether international support in its development should be sought.

The results of the study, to be carried out by the Senior Inter-Agency Group for Space in the U.S., are due to become available this autumn.

In the meantime, however, it is becoming clear that the timescales for Shuttle launches originally laid down are taking much longer to implement than expected. At one time, NASA had hoped to achieve Shuttle launches at a rate of about one every two weeks, using both the Cape Kennedy, Florida, and Vandenberg, California, launching bases.

In the event, because of technical delays, the turn-round times for the Shuttle have been longer than planned, although it must be admitted that in the early developmental phases of such a complex and expensive system it is better to be safe than sorry.

It is recognised by NASA that these turnround times must be substantially improved, without in any way prejudicing the safety of astronauts, vehicles or payloads, before the Shuttle can become commercially viable.

Much work is now being done in the U.S., not only by NASA, but throughout the aerospace industry which has designed, developed and built all the myriad parts of the intricate Shuttle system, to improve the system and help achieve as soon as possible the target of commercial reliability and hence also viability.

No one doubts that the target eventually will be achieved, and that before the end of this decade Shuttle launches will have become a regular feature of U.S. space activity. The only question is how long it will take. Even now, however, the U.S. is planning a rising schedule of Shuttle launches, and a rate of 10 to 12 a year by the later 1980s does not seem an impossible amibition, rising rapidly thereafter through the 1990s.

In the meantime, a heavy reliance is still placed by prospective commercial and other customers on the use of conventional rocket launchers to put their satellites into orbit, with a reluctance by some to commit their expensive payloads to the Shuttle (a view shared by the insurance market which has found past satellite launching failures an exceptionally expensive risk).

Last year, for example, despite the successful launch of two commercial communications satellites from Shuttle STS-5 in November, marking the start of operational uses of the Shuttle, there were still 11 successful launches by conventional rockets, mainly of commercial and international communications satellites.

Similarly, in 1983, although a further four launches of the Shuttles (STS-7, 8, 9 and 10) are planned, there will be 17 unmanned rocket launches, many of them carrying commercial communications and other satellite payloads although some scientific satellites are also involved.

Similarly, in Western Europe development of the conventional Ariane rocket launcher vehicle, has had its difficulties, with the failure of the L-5 launch last autumn. As a result, the European Space Agency has now revised its programme, with L-6 now set for launch in early June, to be followed later in the year by L-7 in August, L-8 in November, and L-9 next January.

Of these, L-6 will launch the European Communications Satellite (ECS) and the Amsat (Radio Amateur Telecommunications Satellite). The L-7, L-8 and L-9 launchers have been assigned to the launching of the big Intelsat V satellites for the International Telecommunications Satellite Organisation.

But even the European Space Agency has found it difficult to fit all of its launch commitments into the rearranged schedule, and the European X-ray Observation Satellite, Exosat, will be launched by a U.S. Thor-Delta rocket from the U.S. Vandenberg base in late May, this year.

Following this programme, the L-10 Ariane will be the first launch of the more powerful rocket, capable of injecting two spacecraft, each of up to 1,195 kilogrammes, into geostationary transfer orbit.

Trends

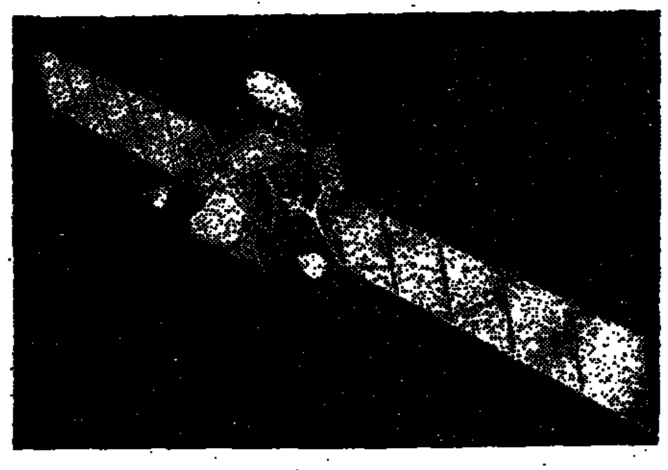
It is intended that the European Space Agency's ECS-2 and the Marecs B-2 communications satellites, together with the French statellites Telecom 1A and B, and the Arab League's satellite, Arabsat-1, as well as the U.S. commercial satellites, Western Union's Westar-6 and Southern Pacific's Spacenet-1 and 2, will all be launched in the near future by the Ariane 3

Because trends will require the launching of even bigger payloads from the mid-1980s on, the European Space Agency is now developing a more powerful version still of the Ariane, the Series 4. This will become available in several versions, capable of putting payloads of between 2,000 and 4,300 kilogrammes into Earth transfer orbit.

This flexibility of launch vehicle availability will enable a wider variety of payloads to be accommodated, keeping the "occupancy rate" of the launcher at a high level. The first test launch of an Ariane 4 is expected in the second half of 1985, and it should be operational from 1986 onwards, with among its likely first payloads the very large Intelsat VI series of communications satellites.

At the same time, to speed the launching rate of Ariane rockets, and cater for the bigger versions of the Ariane now on the way, the European Space Agency is building a second launching platform at the present launching base at Kourou in French Guiana. This will enable one Ariane to be readied for launch while another is being sent off into space, and it is expected that this will reduce the intervals between launches to one month.

This improved launching rate will become necessary because the revised schedule now drawn up for Ariane envisages a total of nearly 20 launches up to the end of 1985, putting nearly 40 separate payloads into Earth orbit, of which the majority will be communications satellites of one kind or another.



Artist's impression of UNISAT, the broadcasting satellite for the UK which will provide two channels of television programmes direct to homes.

Conscious of the need to compete with the Shuttle, by providing a viable alternative launching system for those countries or commercial customers who for one reason or another do not wish to use the U.S. facilities, the European Space Agency is now studying what to do beyond Ariane 4.

A new engine, using liquid oxygen and liquid hydrogen, and giving 90 tonnes of thrust, has been selected as a key element in the future launch system, but the possible launcher configurations themselves are still being studied.

The possibilities include an even bigger Ariane, using the 90 tonnes thrust engine that would be able to put payloads of up to 15 tonnes into low orbit round the earth by 1992, as well as launchers that, in the longer term, could be partially or even totally recovered once fired, as parts of the Shuttle system are recoverable now.

Michael Donne

Military satellites gather intelligence in secret war

THE MILITARY uses of space have been exploited since the first Sputnik was launched over a quarter of a century ago, on October 4, 1957. Both the U.S. and the Soviet Union have made and still make, extensive use of satellites, primarily for communications or surveillance purposes, but many of the satellites that are launched for military purposes are either not publicised, or if so, their precise tasks in Earth orbit are never revealed.

Many of the planned launches of the new U.S. Space Shuttle system through the 1980s are intended to carry payloads for the Department of Defence, primarily satellites for a wide range of tasks—communications, surveillance, missile tracking and other purposes.

These roles include photographic reconnaissance, nuclear blast detection, electronic intelligence gathering, navigational aids for military aircraft and ships, military weather forecasting, and extensive aerial mapping. So far as is known, neither the U.S. nor the Soviet Union have yet actually resorted to the deployment of weapons aboard spacecraft, but the longer-term eventual possibilities of such activities cannot be ignored.

Even without such use of spacecraft as weapons platforms, however, it is clear that in any future hostilities, the enemy's spacecraft must be prime targets if only because of the communications, surveillance and other "non-shooting" but nonetheless vital uses to which they are put. The development of techniques to detect those uses is thus a vital element in this continued escalation of the military uses of space.

Some time ago, the U.S. Air Force set up a Space Command to take over all the military activities evolving from the exploitation of this new frontier of technology, and in the recent past its activities have been substantially extended.

Among its current studies are plans for the eventual development of a "space-to-space" reconnaissance system, to detect hostile satellites from afar; development of a warning laser receiver for U.S. military satellites; and evasive manoeuvring techniques for satellites and other spacecraft.

Although little has been published about their activities in the West, it is believed that Soviet satellite scientists are working along similar lines, as Mr Caspar Weinberger, U.S. Defence Secretary, said recently in his report on Soviet military power.

Mr Weinberger's report suggested that the Soviet Union could launch the first prototype of a space-based anti-satellite laser system in the late 1980s or early 1990s, while an operational system, capable of attacking other satellites within a few thousand km range could be established in the early 1990s.

On the other hand, space-based anti-ballistic missile systems would be more difficult and expensive to develop, but could be tested in the 1990s, probably becoming operational around the turn of the century.

The Soviet Union is known to be building bigger and more powerful rocket vehicles that could give it the capability of deploying large weapons systems in near-Earth orbit, although it has not yet developed a system approaching the U.S. Space Shuttle manned, reusable space transport system.

This steadily-emerging militarisation of space was given added point by President Reagan's speech earlier this spring, when he called for definition studies for a long-term "space defence programme", designed to ensure that the Free World was not overtaken by Soviet military space developments.

Although President Reagan's speech was criticised by some, it was widely accepted in the defence industries as indicating a proper awareness of the vast potential of space as a future battleground, with a determination to ensure that the U.S., on behalf of itself and its allies, did not get left behind. The U.S. is determined "not to surrender the high ground of space" to the Soviet Union.

Subsequent to the President's speech, it is expected that available funds for military research, development and exploitation of space will expand. Spending on anti-satellite space laser systems, for example, is expected to rise to over $500m annually by 1987-88, while the USAF's space surveillance research will rise to over $100m a year by 1985-86.

M. D.